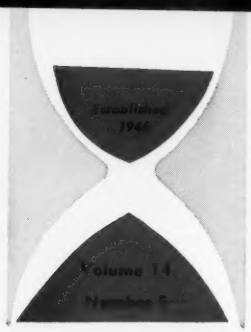

Geriatrics

MAY 1959

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References: 1. Graham, W.: Canad. M. A. J. 79:634 (Oct. 15) 1958. 2. Robins, H. M.; Lockie, L. M.; Norcross, B.; Latona, S., and Riordan, D. J.: Am. Pract. Digest Treat. 8:1758, 1957. 3. Kuzell, W. C.; Schaffarzick, R. W.; Naugler, W. E., and Champlin, B. M.: New England J. Med. 256:388, 1957.

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INFORMATION FOR AUTHORS

The editors of GERIATRICS invite physicians to submit original papers in the field of geriatric medicine. Interest and value to the practicing physician are paramount.

Manuscripts should be typewritten, double spaced. Recommended length is from 3,500 to 5,000 words. Authors' full names, academic or professional affiliation, and complete addresses should be included. No more than three names should be listed. Credit to contributing workers may be given in a footnote.

References should be kept to not more than 20 citations and should be typed on a separate sheet. Both journal and book references should follow the style of the *Index Medicus*. References are to be numbered and listed consecutively as they appear in the manuscript. A summary of 40 to 60 words for use at the head of the article should accompany the manuscript.

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TO THE JUNE ISSUE

■ In an attempt to determine the limit of "normalcy" in blood pressure, Richard P. Lasser and Arthur M. Master of the Department of Medicine, Mount Sinai Hospital, New York City, made extensive *Observations of Frequency Distribution Curves of Blood Pressure in Persons Aged 20 to 106 Years.* Frequency distribution curves for both sexes in increments of five-year age groups were constructed, mean and modal pressures were determined, and the limits of both a middle 80 and 90 per cent range were drawn. Findings from the study were used as an approach to the selection of patients for antihypertensive therapy. The authors give their recommendations as to suitable candidates for such therapy.

■ Geza de Takats, clinical professor of surgery, University of Illinois College of Medicine, and attending surgeon, Research and Educational Hospitals and Presbyterian—St. Luke's Medical Center, Chicago, discusses the results of a *Ten-Year Follow-Up Study of Surgically Treated Hypertensive Patients.* According to the author, diastolic hypertension is a progressive disease which can become a self-perpetuating mechanism, and, if it is not sufficiently lowered, it will cause widespread cardiovascular renal disease. As evidenced by the results of a study of 105 surgically treated hypertensive patients, an early systemic attack definitely slows down the progress of the disease.

■ *Androgenic Effect on Senescent Memory Function* was studied in an experimental group of 13 residents in a home for the aged and compared with the effect on a matched control group by V. A. Kral and B. T. Wigdor of the Gerontologic Unit of the Allan Memorial Institute, Department of Psychiatry, McGill University, Montreal. They found significant improvement in recall of logical and meaningful material in the experimental group. Improvement was the most marked for individuals with mild memory defect.

■ Thomas L. Hartman and Walter K. Myers of George Washington University School of Medicine and the Department of Medicine, Washington Hospital Center, believe that the *Occurrence of Bacterial Endocarditis in Older Individuals* is more frequent than has previously been reported. Seven of the 21 patients in their study were over 60 and responded as well to therapy as did the younger ones. Recovery from bacterial endocarditis after the age of 60 is possible, and normal activity may be regained.

■ How can the problem of *Alcoholism in a Home for the Aged* be met in an institution with only the traditional facilities? The first step in the management of the person whose alcoholism has been discovered is to attract the sympathy and solicit the help of staff as well as residents, writes William C. Twigg, governor of Sailors' Snug Harbor, Staten Island, New York. A reasonable solution can be found by marshaling all of the communal facilities—the home itself, the hospital, and the psychiatric, social, and judiciary services.

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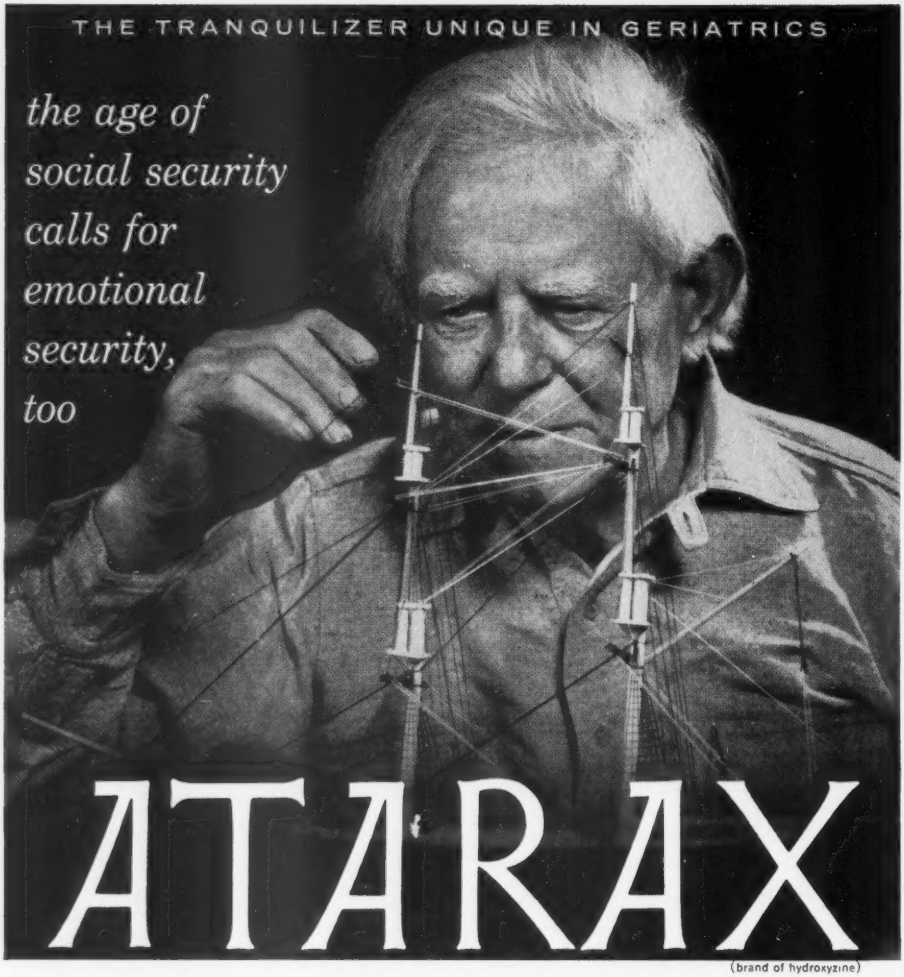

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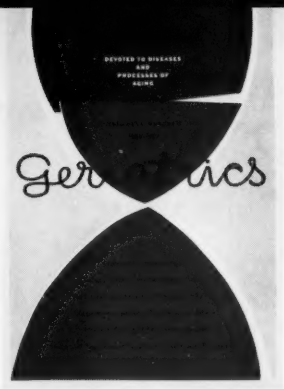


A new dress for Geriatrics

In medical publishing, editorial progress requires keeping abreast of all new developments in both the research and clinical areas of medicine. Our editors devote themselves to meeting this challenge, and for nearly fourteen years, *Geriatrics* has presented to its readers the latest information on the diagnosis and treatment of the diseases of the aged.

Just as there is progress in science, so there are advances in physical presentation of medical articles. For more than a year, the publishers and editors have been making plans for a new typographic design for our journal. An outstanding designer was engaged to study our publication and its field of service and to make recommendations for improving its format. You see the results of his work in this issue.

The artist responsible for this new look is George Samerjan of New York City, an artist with a distinguished record in the very specialized field of magazine design. He has been art director for several leading publications and his covers are currently appearing on *Harper's Magazine*. He has been commissioned by the United States Government to design presentations for several important projects.

His grasp of the subject is well reflected in this issue and the issues that will follow. As you leaf through the magazine, you will notice that photographs, charts, and tables are arranged and designed to make them clear and understandable. New typographic changes make the pages easier to read, and a pleasing, comfortable arrangement has been achieved by a judicious use of color.

The basic editorial objectives of our editors remain unchanged. They will continue to give you the new and important findings relating to geriatric medicine. The new format will modernize the publication and make it more functional and attractive to the eye.

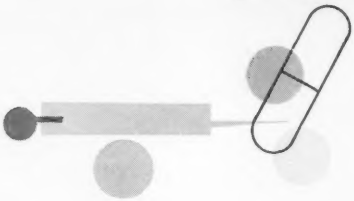
It is our hope that our effort will be as pleasing to our readers as it is to the publishers and the editors.

THE PUBLISHERS

Geriatrics

THERAPEUTIC GUIDE

MAY 1959



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Garvey, F. K. & Cline, W. A., Urol. & Cutan. Rev. *56*:23-24, Jan. 1952. Hinman, F., Jr., California Med. *76*:1-7, Jan. 1952. Rhoads, P. S.; Billings, C. E. & O'Connor, V. J., J.A.M.A. *148*:165-170, Jan. 19, 1952. Womack, C. R.; Jackson, G. G.; Gocke, T. M.; Kass, E. H.; Haight, T. H. & Finland, M., Arch. Int. Med. *89*:240-256, Feb. 1952. Baker, R., S. Clin. North America *32*:311-323, Feb. 1952. Kimbrough, J. & Morse, C. W. H., Mil. Surgeon *110*:177-180, March 1952. Raabe, S., Medizinische *9*:282-286, March 1, 1952. Royce, R. K., Bull. St. Louis M. Soc. *46*:457-458, March 21, 1952. McMartin, W. J. & Milam, D. F., J.A.M.A. *148*:1117-1121, March 29, 1952. Waisbren, B. A. & Carr, C., Am. J. M. Sc. *223*:418-421, April 1952. Secretan, M., Schweiz. med. Wchnschr. *82*:345-350, April 5, 1952. Ney, C. & Markham, M. J., New York State J. Med. *52*:1033-1035, April 15, 1952. Secretan, M., Schweiz. med. Wchnschr. *82*:453-456, April 19, 1952. Abruzzi, W. A., Tufts M. J. *19*:15-20, May 1952. Bourgeois, G. A., Am. J. Surg. *83*:671-673, May 1952. Carroll, G. & Brennan, R. V., J. Internat. Coll. Surgeons *17*:809-813, June 1952. Lazarus, J. A. & Wood, W. A., Am. Pract. & Digest Treat. *3*:445-452, June 1952. Raabe, S., Medizinische *9*:271-304, March 1, 1952. Abstracted in J.A.M.A. *149*:712, June 14, 1952. Carroll, G. & Brennan, R. V., J. Urol. *68*:88-95, July 1952. Schoonover, F. S., Jr., M. Times *80*:425-430, July 1952. Singer, P. L., Clin. Med. *59*:317-320, July 1952. Prentiss, R. J.; Mullenix, R. B. & Whisenand, J. M., California Med. *77*:7-11, July 1952. Yow, E. M., J.A.M.A. *149*:1184-1188, July 26, 1952. Becher, H., Med. Monatsschr. *5*:786-787, Nov. 1951. Flint, L. D., S. Clin. North America *31*:681-690, June 1951. Cummings, R. H., Arizona Med. *8*:28-33, July 1951. Duffy, D. B., M. J. Australia *2*:107, July 1951. Anonymous, Am. Prof. Pharm. *17*:726-727, Aug. 1951. Carroll, G. & Brennan, R. V., J. Florida M. A. *38*:257-259, Oct. 1951. Renshaw, J. E., J. Am. M. Women's A. *6*:438-439, Nov. 1951. Carroll, G. & Brennan, R. V., South. Med. & Surg. *113*:358, Nov. 1951. Baird, S. S., Am. Pract. & Digest Treat. *2*:1038-1041, Dec. 1951. Colston, J. A. C., West Virginia M. J. *47*:377-383, Dec. 1951. Rhoads, P. S.; Billings, C. E. & Adair, D. M., (Proc. Central Soc. Clin. Res., 24th Ann. Meet., Chicago, Ill., Nov. 2-3, 1951) J. Lab. & Clin. Med. *38*:942, Dec. 1951. Herrold, R. D., S. Clin. North America *30*:61-69, Feb. 1950. Burns, E., J. Omaha Mid-West Clin. Soc. *11*:37-45, April 1950. Plichet, A., Presse méd. *58*:193, April 29, 1950. Bigler, J. & Thomas, O., Am. J. Dis. Child. *79*:785-790, May 1950. Howard, F. S., Stanford M. Bull. *8*:66-72, May 1950. Anonymous, Southwestern Med. *31*:178, June 1950. Gloor, H. U., Praxis *39*:687-689, Aug. 10, 1950. Carroll, G.; Allen, H. N. & Flynn, H., Postgrad. Med. *8*:312-316, Oct. 1950. Weir, A. B., Jr., South. M. J. *43*:868-871, Oct. 1950. Hess, E.; Roth, R. & Kaminsky, A. F., J.A.M.A. *144*:601-605, Oct. 21, 1950. Stewart, B. H. & Lash, J. J., J. Urol. *64*:801-810, Dec. 1950. McCrea, L. E. & Schneeberg, A., J. Internat. Coll. Surgeons *14*:721-725, Dec. 1950. Thompson, R. F., Southwestern Med. *31*:403-409, Dec. 1950. Hinman, F., Jr., Ann. West. Med. & Surg. *4*:829-833, Dec. 1950. Carroll, G.; Allen, H. N. & Flynn, H., J.A.M.A. *142*:85-86, Jan. 14, 1950. Langemann, H., Schweiz. med. Wchnschr. *80*:78-81, Jan. 28, 1950. Birchall, R. & Alexander, J. E., Medicine *29*:1-28, Feb. 1950. Wilhelm, S. F. & Orkin, L. A., J. Urol. *61*:131-139, Jan. 1949. Rhoads, P. S.; Svec, F. A. & Rohr, J. H., Quart. Bull. Northwestern Univ. M. School *23*:104-111, Spring 1949. Lazarus, J. A. & Schwarz, L. H., J. Urol. *61*:649-657, March 1949. Schiffrin, M. J., Mod. Hosp. *72*:104, 106, 108, 110, March 1949. Rhoads, P. S.; Svec, F. A. & Rohr, J. H., Mississippi Valley M. J. *71*:87-89, May 1949. Schweinburg, F. B. & Rutenberg, A. M., Proc. Soc. Exper. Biol. & Med. *71*:20-23, May 1949. Rhoads, P. S.; Svec, F. A. & Rohr, J. H., Proc. Inst. Med., Chicago *17*:356, June 15, 1949. Brickhouse, R. L.; Lepper, M. H.; Stone, T. E. & Dowling, H. F., Am. J. M. Sc. *218*:133-137, Aug. 1949. Carroll, G.; Allen, H. N. & Flynn, H., Urol. & Cutan. Rev. *53*:677-683, Nov. 1949. Wilhelm, S. F.; Schloss, W. A.; Orkin, L. A.; Seligmann, E. & Wasserman, M., J.A.M.A. *141*:837-839, Nov. 19, 1949. Herring, A. L., Mississippi Doctor *27*:329-332, Dec. 1949. Thompson, H. T., J. Urol. *62*:892-899, Dec. 1949. Sarnoff, S. J.; Freedman, M. A. & Hyman, A. A., J. Urol. *55*:417-427, April 1946. Haines, W. H. & Miceli, S., Pennsylvania M. J. *50*:1328-1330, Sept. 1947. Narins, L., J. Urol. *59*:92-95, Jan. 1948. Rodgers, R. S. & Colby, F. H., J. Urol. *59*:659-663, April 1948. Sarnoff, S. J., Proc. Soc. Exper. Biol. & Med. *68*:23-26, May 1948. Rhoads, P. S.; Svec, F. A. & Rohr, J. H., (Proc. Central Soc. Clin. Res., 20th Ann. Meet., Chicago, Ill., Oct. 31-Nov. 1, 1947) J. Lab. & Clin. Med. *32*:1530-1531, Dec. 1947. Lazarus, J. A., M. Clin. North America *32*:1415-1425, Sept. 1948. Scholl, A. J.; Hinman, F.; Crowley, E.; Heiner, A. B.; Gutierrez, R.; Thompson, C. J. & Cook, E. N. & O'Conor, V. J., Arch. Surg. *57*:699-728, Nov. 1948. Fergusson, J. D., Reinold, D. G. & Wrigley, F., Lancet *2*:969-971, Dec. 18, 1948. Rieser, C. in Conn, H. F., Ed., Current Therapy 1958, Philadelphia, W. B. Saunders Co., 1958, p. 401. Rieser, C. in Conn., H. F., Ed., Current Therapy 1958, Philadelphia, W. B. Saunders Co., 1958, p. 402. Clapper, W. E. & Plank, L. E., J. Urol. *75*:339-341, Feb. 1956. Hughes, J.; Coppridge, W. M. & Roberts, L. C., North Carolina M. J. *17*:320-324, July 1956. Campbell, M. F., Mod. Med. *24*:85-91, Nov. 15, 1956. Bernardi, A., Southwestern Med. *37*:68, Feb. 1956. Bayer, H., Aerztl. Praxis *8*:(29), 1956. Lowsley, O. S. & Kirwin, T. J., Clinical Urology, ed. 3, Baltimore, The Williams & Wilkins Company, 1956, vol. 2, p. 776. Lowsley, O. S. & Kirwin, T. J., Clinical Urology, ed. 3, Baltimore, The Williams & Wilkins Company, 1956, vol. 2, p. 975. Winer, J. H., California Med. *84*:204-205, March 1956. Creevy, C. D., Minnesota Med. *39*:281-284, 306, May 1956. Marks, R. G.; Ravich, L. & Wilhelm, S. F., J. Urol. *73*:179-181, Jan. 1955. Harris, J. A. & Vest, S. A., Postgrad. Med. *17*:58-65, Jan. 1955. Garvey, F. K. & Straweutter, H. E., North Carolina M. J. *16*:63-64, Feb. 1955. Carroll, G., J. Urol. *73*:609-612, March 1955.

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Histology

ARTHUR WORTH HAM, F.R.S.C., 1957. Philadelphia: J. B. Lippincott Company. London: Pitman Medical Publishing Company. Third edition. 894 pages. Illustrated. $11.20.

As compared to the second edition, which appeared in 1953, the third edition of this book contains entirely new chapters and additions which contribute a great deal to a better understanding of the fine structures and the functions performed by different kinds of tissues. Chapter 4, which deals with electronmicroscopy, brings the book up-to-date in histologic methods of study. The ultramicroscope is described in detail, and most of the technics used in preparing sections for ultramicroscopy are listed and discussed.

Special consideration is given to the field of tissue transplantation in chapter 11 and in subsequent chapters dealing with each specific type of tissue. This topic is explained in the light of modern concepts of tissue immunology as the basic feature underlying the processes of homograft and heterograft rejection.

Endocrine glands are considered not only from a purely anatomic point of view but also as important functional entities of correlation. Considerations of the functions and hormone production of each endocrine gland precede the description of its anatomic structure. This helps to explain morphologic changes observed in certain endocrine organs in normal states as well as in those of hypo- or hyperfunction.

Each chapter ends with a list of the most important and classical bibliographic references for those interested in looking into the original sources of information in any particular subject.

The book is well and copiously illustrated with black and white as well as color prints when these are desirable for the recognition of some structures and the staining characteristics of certain tissues.

As a text of histology for medical or dental students or as a reference book for those more deeply involved in histologic studies, Dr. Ham's *Histology* should be warmly recommended.

CARLOS MARTINEZ, M.D.
Minneapolis

Cardiovascular Diseases

DAVID SCHERF, M.D., and LINN J. BOYD, M.D., 1958. New York: Grune & Stratton, Inc. 829 pages. Illustrated. $17.75.

The first nine chapters are devoted to a review of the anatomic and chemical mechanisms of the normal and abnormal heart. Dyspnea, compensation and decompensation, and embolism and thrombosis are described in terms of physiology and pathology with details of gaseous exchange and tissue morphology. The clinical manifestations of abnormalities in structure and function of the component parts of the circulatory system are explained.

Further chapters discuss rheumatic fever, bacterial endocarditis, valvular lesions, and diseases of the myocardium and the pericardium with attention to all phases of each, diagnostic and therapeutic.

Symptoms and signs of congenital hypertensive and arteriosclerotic abnormalities are analyzed from the standpoint of mechanical and chemical cause and effect.

Diseases of the peripheral vascular system are considered thoroughly in the longest chapter in the book. Almost as long is the one on therapy which gives the pharmacologic action of the drugs in common use for the treatment of cardiovascular problems.

The text is concise and readable with adequate illustrations and many comments on the authors' own experiences with unusual or enlightening cases. References to literature are unobtrusive in the descriptive ma-

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Current Concepts in Therapy: Sedative-Hypnotic Drugs II. Chloral Hydrate. New England J. Med. 255: 706 (Oct. 11) 1956.

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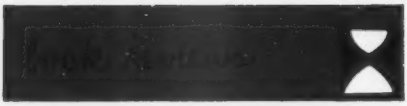

(Continued from page 24A)

terial but listed completely in the index portion of the book. Preference for certain medicaments and skepticism about others are expressed as the different diseases are discussed and especially emphasized in the chapter devoted to therapy.

The reader feels that he has been exposed to the wisdom of clinicians of experience and judgment concerned with the whole patient and that whenever he needs advice concerning a question of cardiovascular disease he will turn to the chapter and page to find out what Scherf and Boyd think about it.

OLGA S. HANSEN, M.D.
Minneapolis

Practical Leads to Puzzling Diagnoses

WALTER C. ALVAREZ, M.D., 1958. Philadelphia: J. B. Lippincott Company. 490 pages. $9.

Dr. Alvarez takes as his theme for this volume the overwhelming significance played by neurotically defective heredity. He stresses the need for a painstaking history. In almost 500 pages of rather closely printed text he analyzes the data on 579 patients and their relatives which he has gathered in fifty years of practice. It is extremely thought provoking that only 7 per cent of overt psychotic patients come under the scrutiny of a psychiatrist.

The constant reiteration of epilepsy, alcoholism, bizarre pain syndromes, and just plain inadequate personality is well worth the thoughtful attention of every practicing physician. Dr. Alvarez has an inimitable style all his own. Not only doctors but most intelligent lay readers would find the reading of this book well worth their time. The chapter on hysteria, closely followed by the one on Sexual Difficulties in Men and Women, should be a must for every internist and general practitioner. The surgeon could ponder the discussion of The Psychiatric Patient Who Loves Operations. Our professional do-gooders could reread many times the crisp chapter on Psychopathic Delinquents and we all could take to heart the exquisite lines on The Art of Handling Nervous Patients.

This being a new book, the usual first edition errors are visible, even if few. Thus, on page 425, *Chief* Justice Holmes (commenting on the Virginia Sterilization Statute) is quoted as saying "three generations of imbeciles are enough." I assume that Dr. Alvarez is quoting from a decision by the late distinguished jurist, Oliver Wendell Holmes, Jr., who was an *associate* justice of the U.S. Supreme Court. He previously had been chief justice of the Massachusetts Supreme Court but never of the Federal judiciary.

Much more serious is the apparently inadequate editing on page 418 on children with chorea. Dr. Alvarez, of course, knows that there are *two* diseases so designated and differentiated by the attached eponym. Since he does not seem to be discussing Huntington's chorea, it is, in my opinion, a grave injustice for sufferers with Sydenham's chorea to be so stigmatized. While it is true that, just as with rheumatic fever (also caused by streptococcic infection), Sydenham's chorea tends to develop in the more susceptible strains, personality deterioration does *not* develop unless already present before the onset of the chorea. If medical and other workers, relying on the immense authority and prestige of Dr. Alvarez, will begin quoting this specific passage, much harm may ensue. I'm sure that others will also call his attention to this rather unfortunate passage so that it can be revised in the next edition of this work.

Overall, my main adverse criticism of the entire volume rests on the proposition that Dr. Alvarez seems to let his missionary zeal outrun his editorial discretion. It is wonderful to see Dr. Alvarez tear apart the "there is nothing the matter with you" approach to the hag-ridden neurotic. I believe he should be equally enthusiastic in demolishing the so called "psychosomatic approach" used to justify sloppy handling of a diagnostic problem in a genuine organic disease. For example, a urologist may clear up a swollen, boggy prostate, which apparently accounted for a low backache, and yet find

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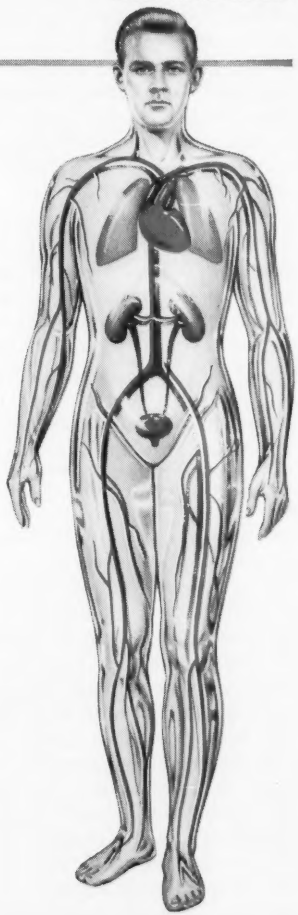

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book reviews

(Continued from page 26A)

that the patient's symptoms may get worse. If the patient is now branded a "neurotic," how will the internist feel three months later when there will be a polite letter from a "mere" general practitioner who had just seen the patient and found a protruded L_5 disk to account for the pain and the additional symptom of beginning impotence?

One must not denigrate in any way the fascinating readability and enormous value of Dr. Alvarez' down-to-earth writing. Here, it is more a matter of exact shade of emphasis. The physician or lay person reading this book will imbibe painlessly, in fact, most delightfully, the distilled essence of a lifetime of practical observations made by one of the world's most famous and astute diagnosticians.

This volume can be recommended reading at almost any level of intelligence and education. The physician in particular will have a greater comprehension of the *how* to approach some of his more baffling problems.

ARNOLD LIEBERMAN, M.D.
Elmhurst, New York

Neurological Basis of Behaviour

G. E. W. WOLSTENHOLME and CECILIA M. O'CONNOR, editors, 1958. Boston: Little, Brown & Company. Ciba Foundation Symposium. 400 pages. Illustrated. $9.

In recent years the study of neurology has been enormously expanded by rapid simultaneous progress into many previously uncharted areas of anatomy and physiology. Refinement of physiologic technics has increasingly permitted investigation of the functions of the nervous system in the intact organism. In turn, behavioral scientists have been attracted to investigation of problems that require integration of such diverse fields as neuroanatomy and neurophysiology, pharmacology, endocrinology, animal psychology, and psychiatry. The fruits of this integration have been a deepening knowledge of brain function, which permits the stimulating title of this volume.

The Ciba Foundation has gathered a distinguished group of investigators and has strung the pearls of their free discussion upon the necklace of brief, loosely interconnected papers. The entire volume is appropriately dedicated to Sir Charles Sherrington on the centenary of his birth, since he is the intellectual godfather of many of these investigators. In the main, this is a volume by specialists for specialists. However, for men of such stature as Eccles, Jasper, Kluver, Magoun, and Penfield, to mention only a few, the experimental conclusions constitute not the end of study but the roots from which will grow a physiologic system of vast ramifications. What its final state will be no one can envisage, but therein, for example, may reside the answer to some forms of mental illness. The stimulation of informal discourse leads the participants into the broader implications of their work.

For the general reader who wishes to share the sense of excitement attendant upon exploration into new lands, this volume presents a challenge. He must be willing to skim over detail in search of the generalizations and integration of concepts the authors offer. The effort, however, is rewarding when the reader begins to perceive how the incredibly complex activities of billions of neurons are woven into an intricate behavioral pattern by what Sherrington himself called the "enchanted loom."

DAVID DALY, M.D.
Rochester, Minnesota

Tumor Surgery of the Head and Neck

ROBERT S. POLLACK, M.D., 1958. Philadelphia: Lea & Febiger. 101 pages. Illustrated. $5.

The basic purpose of this book is not at once apparent. If the intention is to inform the medical student, intern, or practitioner regarding procedures about which he should have at least some information, but which he will never do, there is too much space given to illustrations of steps in technic. If the book is designed for the general surgeon who might occasionally work in this field, too much time and space are devoted to procedures he should not attempt and too little to those he should and could do. The surgeon who is already trained and experienced in this kind of surgery would, it seems to

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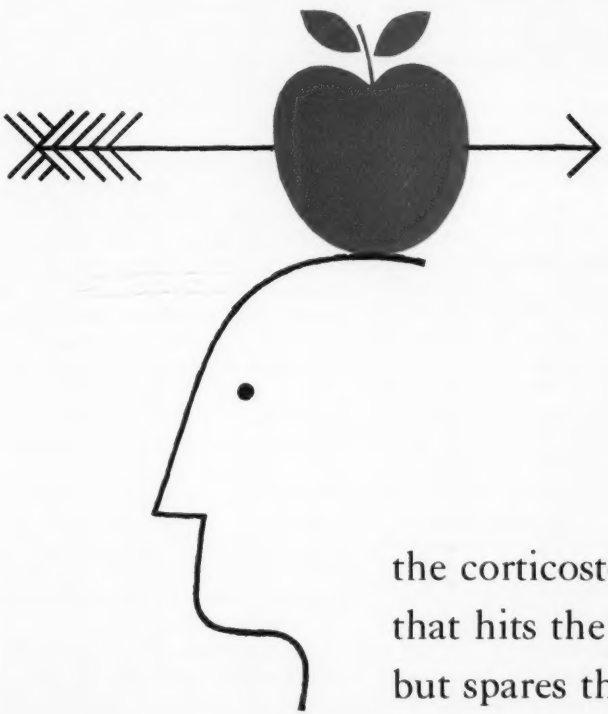

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(Continued from page 30A)

the reviewer, find the book inadequate. In an endeavor to include a little something for everyone, so to speak, the author may come close to pleasing no one.

Many basic procedures are left out or handled in cursory fashion. In the introduction, the author lightheartedly dismisses this deficiency, stating that "excellent information on related procedures can be obtained elsewhere." A good deal of elsewhere-looking would be involved. Drawings at times are quite oversimplified, at least from the standpoint of the man looking for helpful "how-to-do-it" information. At other times, as in figures 45 and 46, the legends are run together from adjoining figures in such a way as to be confusing.

General discussions are usually quite skimpy; however, these constitute a good feature of the book, for they do contain copious references to excellent articles in the literature. The bibliography that results is a real asset.

If a reader is interested in a book about 100 pages long, of modest cost, which will hit the high spots of this subject and in which the thinking is orthodox, this publication is at least called to his attention. If he wants a handy little volume with a good bibliography of the subject, accompanied by some illustrative material, he will like this book.

JOHN H. ROSENOW, M.D.
Minneapolis

Radioactive Isotopes in Clinical Practice

EDITH H. QUIMBY, SERGEI FEITELBERG, M.D., and SOLOMON SILVER, M.D., 1958. Philadelphia: Lea & Febiger. 451 pages. Illustrated. $10.

This book, an outgrowth of a course in the clinical use of radioactive isotopes which the authors have conducted for several years, is composed of three parts: Basic Physics by Edith H. Quimby, Instrumentation and Laboratory Methods by Sergei Feitelberg, and Clinical Applications by Solomon Silver. The first part, as might be expected from the well-known, experienced author, is competently written and discusses such subjects as the atom, radioactivity, nuclear reactions, nuclear fission, dosage calculation, biologic effects of ionizing radiation, radiation hazards, and disposal of radioactive waste. It contains a wealth of important information, a substantial part of which is expressed in mathematical formulas which will hardly be understood by the average physician; even radiologists without thorough training in classical physics will find some difficulty in absorbing the material in the presented form.

The second part deals with basic measurements with radiation detectors, determination of isotope distributions within the body, use of detectors in health protection, and laboratory designs among much other useful information. An elaborate effort is made to explain in detail the use of instruments and devices necessary in the application of radioactive isotopes.

The clinical section, which comprises approximately two-fifths of the book, is addressed to the physician who has no previous training in the use of radioactive isotopes and has a limited background in mathematics. The major part of the presentation is concerned with the thyroid gland and radioactive iodine because the author believes that most physicians are interested in this particular phase of utilization of radioactive isotopes. The principles of the use of I^{131} in diagnostic procedures and uptake studies, difficulties in interpretation of diagnostic studies, the localization of I^{131} within the thyroid gland in patients with goiter and cancer, and the treatment of hyperthyroidism and cancer are capably presented. Those interested in the thyroid gland will receive satisfactory, detailed, and very competent information.

The chapters dealing with other radioactive isotopes (phosphorus, gold, cobalt, yttrium) are scanty in their contents; the reasons for this dearth of information are explained by the author in a short preface to the third part. In a book entitled *Radioactive Isotopes in Clinical Practice*, the average reader might expect equally detailed information on all radioactive isotopes useful in medical practice.

(Continued from page 34A)

The difficulty in appraising the entire volume appropriately lies in the evaluation of the background of the readers to whom it is addressed. For those actively engaged in the application of radioactive isotopes, it is a most valuable and informative volume. For the physician in general practice, only a limited part of the book will be truly useful.

PHILIP LEWIN, M.D.
Chicago

The Planning of Rehabilitation Centers

Division of Publications and Reports, United States Department of Health, Education, and Welfare. Washington 25, D. C.: United States Government Printing Office. Papers presented at the Institute on Rehabilitation Center Planning held February 25 to March 1, 1957, in Chicago. 322 pages. $1.25.

This compilation of 27 lectures presented at this Institute is designed to answer some specific questions as to the "what, when, where, how, and why" involved in the planning of rehabilitation centers. Because the experts at the Institute have been concerned with these fundamental problems for many years and have, so to speak, learned to live with the situations engendered by the problems, the emphasis they place upon them is conveyed effectively to listener and reader. Their conclusions can well serve as guides in planning for future rehabilitation centers.

Henry Redkey, chief, Rehabilitation Facilities Branch, Office of Vocational Rehabilitation, describes 7 different types of rehabilitation centers, including treatment, medical rehabilitation, community, insurance and compensation, state vocational rehabilitation, sheltered workshops, and single disability. It is obvious then that in planning for a specific center, objective reasoning must be a major consideration.

Planning a rehabilitation center should be considered only after a thorough survey of the rehabilitation needs of the community has been made and it has been ascertained that the provision of new and expanded facilities is justified. Measurement of needs involves a determination of the number of disabled persons in the community for whom rehabilitation is feasible, the kinds of disabilities these persons have, and the services required for their rehabilitation.

Since rehabilitation centers serve not only the handicapped of the immediate community but also those in the surrounding territory, the service area is that from which patients come or are expected to come to utilize community resources. For certain services, this area may be the entire state and even neighboring states, and, therefore, consultation with the state plan for hospitals and other medical facilities should be the first step in planning the location of the center. Information from rehabilitation agencies, welfare organizations, physicians, hospitals, and clinics is necessary to determine whether they would refer their patients to the new facility. It is also desirable to have an expression of interest on the part of leading industries and labor unions in the area and insurance companies.

The planning of these centers must necessarily depend upon the objectives and goals as determined by local community needs after consultation with local, state, and federal agencies and by the scope of the services to be provided through medical, vocational, and social work avenues. To achieve effective administration and management, a board of trustees should be appointed as well as a full-time executive to act as director and coordinator. Also extremely important for the success of an integrated rehabilitation center are a competent medical advisory committee and medical director.

Great emphasis is placed upon the special role of the physician in the center. In the physical restoration stage, his role is paramount and unquestioned. However, in a larger sense, the physician is concerned in two general areas of institutional policy—the establishment of medical policy within the institution and the maintenance of medical relationships with the community.

According to Dr. Dean Roberts, rehabilitation centers came into being to serve the more severely disabled of the growing num-

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TRAUMATIC STRAINS AND BRUISES

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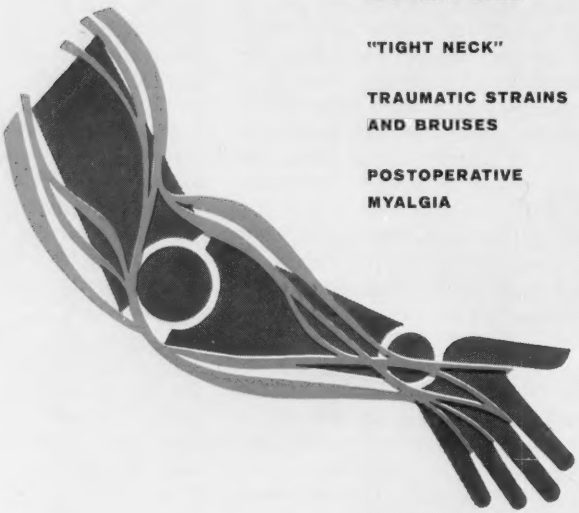

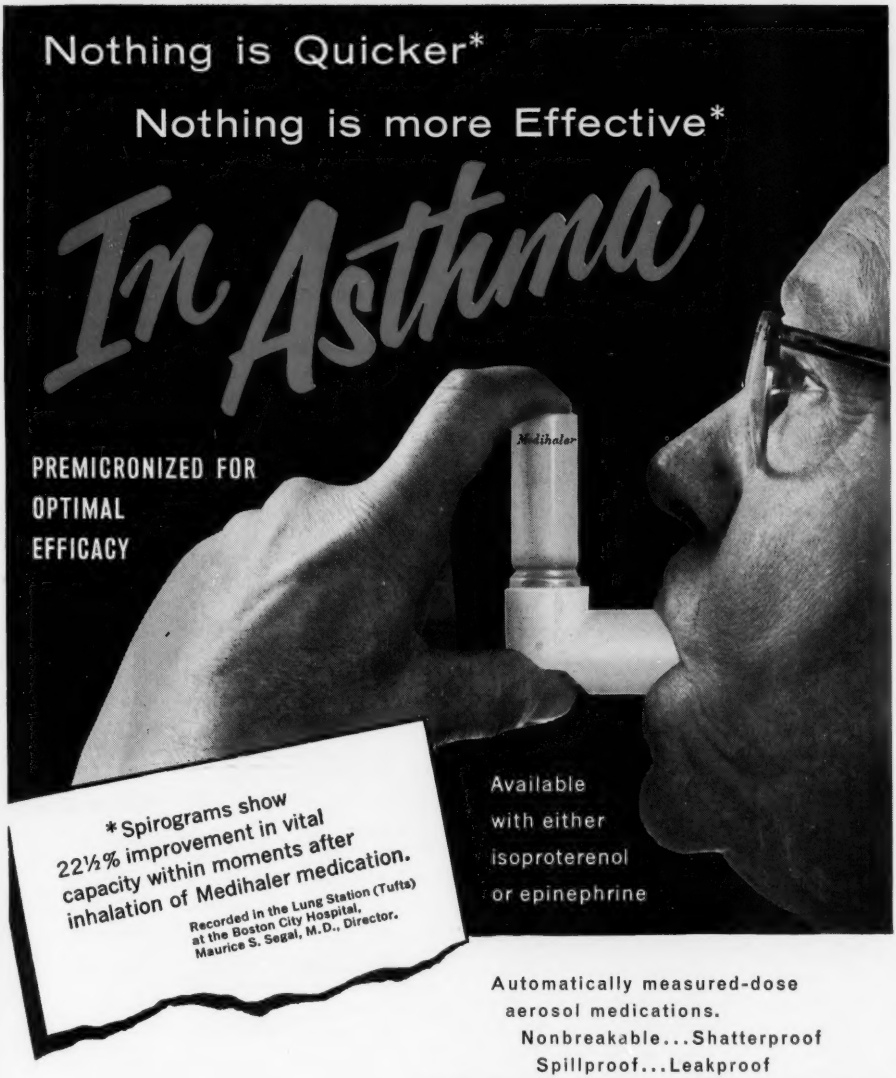
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Riker Northridge, Calif.

(Continued from page 37A)

ber of physically handicapped persons as an exemplification of man's hope for man. Legally and morally we have assumed responsibility for the health and welfare of handicapped persons. The centers are necessary to help develop positive attitudes toward handicapped persons among all groups, and they help employers realize that such people can be made "placeable" as well as "employable."

All in all, this collection of papers is for the purpose of providing information and guidance on the establishment, expansion, or improvement of comprehensive rehabilitation facilities, and any group contemplating such action should carefully study and digest these articles before committing itself to any plan. Inclusion of the salient points of the Hill-Burton Act of 1946 and the amendments of 1954 add to the timeliness and importance of the collection. Physiatrists and others involved in welfare agencies will get much instructive information and interesting reading from this book.

LEO ROSENBERG, M.D.
Dayton, Ohio

Orr's Operations of General Surgery

GEORGE A. HIGGINS, M.D., and THOMAS G. ORR, JR., M.D., 1958. Philadelphia: W. B. Saunders Company. Third edition. 1,016 pages. Illustrated. $20.

As stated in the preface, the authors assumed the task of completing the revision of this third edition after the sudden death of Dr. Orr, Sr. The same chapter outline is used as in previous editions, with the exceptions of the addition of a new chapter on head and neck surgery and the omission of the previous chapter on the lymphatics. However, a discussion of the lymphatics is included in the related systems. The inclusion of the detailed outline of the material to be discussed in each chapter is helpful. The illustrations are ample and clear, and many of them are reproductions from previous texts. The printing is clear and easy to read.

The text material is generally adequate but not excessive. The authors have conformed to well-established operative technics. It should perhaps be most valuable to interns and residents. For a book primarily designed for the use of medical students, this text perhaps does not contain enough basic fundamental information and perhaps stresses technic more than is necessary at that training level.

It is difficult in any discussion as broad as general surgery to cover the subjects specifically and in detail. However, references are included at the end of each chapter for those interested in more information about a subject.

HOWARD H. BRADSHAW, M.D.
Winston-Salem

Disabilities and How to Live With Them

1952. London: The Lancet Limited. 243 pages. $1.50.

This book presents a collection of a series of articles written by 55 disabled persons which appeared in the British medical weekly *Lancet* about ten years ago. It is a pity that this fine book is out of print and also unavailable in many medical libraries in the United States.

There is a wealth of direct information of psychologic value. The clinician will be impressed by many features of long-term illness and disability which sound different from textbook descriptions. It seems that, in many instances, the authors must have been physicians themselves subjected to the diseases and disabilities. Everyone concerned with rehabilitation should read this book, and those interested in geriatrics will be particularly gratified.

MIECZYSLAW PESZCZYNSKI, M.D.
Cleveland

A Doctor Speaks His Mind

ROGER I. LEE, M.D., 1958. Boston: Little, Brown & Company. 120 pages. $3.

From the eminence of his 77 years, Dr. Lee is one of the authentic elder statesmen of medicine. Having written his autobiography in *The Happy Life of a Doctor,* he now turns to jotting down—quite informally—his thoughts on many varied and far ranging topics.

Actually, this slim, vest-sized booklet is a collection of newspaper columns, and it is

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References: 1. Smith, I. M., and Lenyo, L.: Am. Practitioner 9:78, 1958. 2. Bass, A. D.: Chemotherapy of Bacterial Infections II: Sulfonamides, in Drill, V. A., ed.: Pharmacology in Medicine, New York, McGraw-Hill Book Co., Inc., 1954. 3. Pindell, M. H., et al.: J. Pharm. Exp. Ther. 122:61A, 1958. 4. Jawetz, E., et al.: A.M.A. Arch. Int. M. 100:549, 1957.

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book reviews

(Continued from page 42A)

somewhat reminiscent of another Boston physician of a century ago, Oliver Wendell Holmes, writing the *Autocrat of the Breakfast Table.*

Because of their spontaneity, Dr. Lee's musings lack the polish found in the writings of such masters of the pen as Osler and Holmes. Dr. Lee ranges over such diverse topics as The General Practitioner, Changes in the Social Situation, and How are Doctors to be Paid? His comments are urbane, pungent, originally fresh, and altogether charming.

On page 89, Dr. Lee credits William Harvey with the remark on angina pectoris, "I am at the mercy of any rascal who chooses to annoy me." I believe that the great Hunter said that in the following century.

Not only every doctor but most laymen will find this little volume pleasant, relaxing, and thought-provoking in the most delightful way.

ARNOLD LIEBERMAN, M.D.
Elmhurst, New York

The Golden Years

THOMAS COLLINS, 1956. New York: The John Day Company. For mail order: G. S. Rand Publications, Inc., New York. 251 pages. $3.75.

This is a reprint of one of the best books we have seen on retirement. Thomas Collins has studied retirement as it is to be observed all over the United States, from St. Petersburg, Florida, to Los Angeles, California. He tells so well about the old people who feel that when they retire they ought to move somewhere. What they want is not simply to go fishing, but to get recognition for some work still being done and well done and done for some money. He gives some ideas of how old persons can still make money in retirement. He talks about going to an "old people's home" or moving to a farm. One must be aware of the loneliness of life on many farms and also of the possibility of failure on a farm with loss of all one's capital.

There is a chapter on how money should be left to one's children. Discussion is given to the amount of money that some people need to keep in liquid form when they are old, the problems of keeping happy in one's later years, and also what may happen to a widow or a single woman when she retires. As Collins says so well, putting money away for a pension is not a perfect gamble. When you get your money thirty years from now it may not amount to much. It might be much better to keep buying good stocks, the value of which will go up as the value of the dollar goes down and the price of food and lodging goes up.

WALTER C. ALVAREZ, M.D.

New Pamphlets Available

"A Safe Work Load for Farmers With Heart Disease" is a handy 12-page guide designed to help the farmer and his physician plan together a work "prescription" within the patient's capacity. Based on the Purdue Farm Cardiac Research Project, the pamphlet points out that determining the safe work load for an individual requires knowledge of such diverse elements as the energy demands of a particular job; the age, health, body build, job experience, and state of mind of the patient; and the weather. Copies are available from local Heart Associations or from the American Heart Association, 44 East 23rd Street, New York City 10.

"Churches and Their Senior Citizens," the second edition of a booklet written by H. Lee Jacobs, research associate in gerontology at the State University of Iowa, deals primarily with the challenge presented to the church by an aging population and suggests ways by which churches may meet this demand for action. Examples of how these problems have been met in two Iowa communities are cited. In addition to the basic information on aging and the suggestions for keeping retired persons participating members of their communities which were contained in the first edition, the revised edition includes the most recent information on films, literature, and programs. Copies may be secured by writing to the Institute of Gerontology, 26 Byington Road, Iowa City, Iowa.

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1. Cass, L.J., et al.: J.A.M.A. 166:1829 (April 12) 1958. 2. Batterman, R.C., et al.: Am. J. M. Sc. 234:413 (Oct.) 1957. 3. Medical Department, Wyeth: Final Report on the Clinical Evaluation of Zactirin.

book reviews

(Continued from page 48A)

"Summer is Ageless," a recent publication of the National Recreation Association and written by George E. Bowen, gives detailed programs and examples of summer recreation for the aged which will be helpful to departments which already have such programs and to those wishing to set up such programs. The booklet contains discussions of vacation houses, where ten-day summer vacations are offered to underprivileged older persons; camping for older adults; camping for special groups, both institutional and religious; housing facilities and organizing programs; and a series of in-town programs, including a day camp, a park house, large group events, and other outdoor summer events. Because most recreation programs for older persons usually stop when summer comes, the practical suggestions are especially timely. Copies are available for one dollar from the National Recreation Association, 8 West Eighth Street, New York City 11.

"The Nuffield Provincial Hospitals Trust" is a 70-page "record of the progress of schemes and descriptions of new projects from 1955 to 1958." This report gives an account of new grants made in the five-year period and of the progress of projects carried through from previous years. Of special geriatric interest is the section entitled The Care of the Aged, which reports on the Nuffield House Occupation Center, Cowley Road Day Hospital, and Domiciliary Care of Elderly Invalids in the Belfast Area, and a new project, Survey of the Aged in Aberdeen. Requests for copies of this report, which is the fourth in a series, should be directed to the University Press, Oxford, England.

"Federal Programs for Older People" is a 10-page report outlining how government activities on behalf of the aging are carried on in several departments and agencies. According to the bulletin, the principal specialized activities are currently in the Department of Health, Education, and Welfare, the Department of Labor, and the Federal Housing Administration. Serving older citizens as part of a broader group are the Departments of Agriculture, Commerce, Interior, and Treasury, the Veterans' Administration, the Railroad Retirement Board, and the Civil Service Commission. For copies of the bulletin, write to the Social Legislation Information Service, Inc., 1346 Connecticut Avenue, Northwest, Washington 6, D.C.

"The Middle Years—A Time of Change and Preparation" presents in 52 pages the proceedings of the Sixth Annual Iowa Conference on Gerontology, which was held at the State University of Iowa October 7 to 8, 1957. The topics discussed include biologic, psychologic, and marriage relationship changes; preparation for retirement and participation in community life; and research. Free copies are available by writing to Dr. W. W. Morris, Director, Institute of Gerontology, State University of Iowa, Iowa City.

"The Older Person in the Home—Some suggestions for Health and Happiness in the 3-Generation Family" is a 34-page publication of the Public Health Service. It discusses the basic principles of three-generation living and the adjustments essential to its success, the problems that arise when an older person is handicapped, and the care of older persons outside the home. The pamphlet is available for twenty cents from the United States Government Printing Office, Washington 25, D. C.

"Suggested Criteria of Design Standards for State-Aided Housing Projects for Elderly Persons" describes the standards and procedures under which the Connecticut Commission on Services for the Elderly will administer the state's Public Act No. 26 of 1958. Under the Act, the Commission is authorized to contract with local housing authorities for the development, construction, and operation of housing projects for elderly persons of low income. Copies of this first bulletin may be obtained from the State Commission's Chairman, Joseph C. Buckley, 721 Stratfield Road, Bridgeport 4, Connecticut.

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The evaluation of the geriatric patient is devoted to careful examination and attention to details; recognition of multiplicity of involvement of organ systems is fundamental. The anticipation of possible complications due to impairment of function is a necessary component in prevention of postoperative difficulty. Precision in management is required in the elderly patient.

Basic principles in the surgical management of the aged

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NEW YORK CITY

Although age alone does not preclude operation, it is apparent that the management of older patients is influenced greatly by the frequency of degenerative diseases and chronic illnesses that are present in this group.

The geriatric patient differs little from the younger patient when the physiologic effects of aging are determined. It is, however, often difficult to separate the effects of aging from those of degenerative disease processes. There seem to be some physiologic changes in elderly patients that can be attributed to age, as shown in the table; however, more observations are needed to delineate more clearly such alterations. Age appears to cause a decrease in cardiac output, an increase in heart size, and a prolongation of systole—factors which result in a decrease in the efficiency of the heart muscle and cardiac reserve.[1] There is a progressive diminution in renal plasma flow and a reduction in glomerular filtration rate, with a progressive loss in the ability of the renal tubule to perform osmotic work.[2] With age, there is a diminution of total body water.[3] Most of these changes, which are based on age alone, are of rather small magnitude and are not of great moment to the healthy older person. These studies do, however, emphasize the reduction in margin of safety and diminished

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Physiologic Changes due to Aging

Normal	Decreased
Blood volume	Body water
Electrolyte concentration	Cardiac output
Blood glucose	Renal function
Response to ACTH	Ventilatory capacity
	Oxygen consumption

ability to compensate under conditions of stress, such as operative procedures.

Preoperative Evaluation

More important than the physiologic changes in the geriatric age group are the pathologic processes that are so often found. Recognition of degenerative or chronic processes is one of the most pertinent aspects of the evaluation of the elderly patient. The period before operation must be devoted to a search for associated disease processes and abnormalities in organ function. Because some geriatric patients present evidence of malfunction of several organ systems, the physician must be cognizant of the multiplicity of the problems and attempt to assess the relative importance of each. Through a careful, detailed study of each individual, many older patients may be carried through precarious illnesses and major operative procedures.

HISTORY TAKING

The management of the elderly surgical patient thus begins with evaluation, which, in turn, is initiated by a careful history. While it is not feasible to cover all aspects of history taking here, there are certain points which merit emphasis.

It may be noted that many elderly patients tend to minimize or ignore certain symptoms that may be of importance during the stress of major surgical trauma. Some of these patients may suffer impairment of memory and confusion for time relationships, and assistance can be sought from close relatives.

Careful examination of the geriatric patient is needed so that evidence of unsuspected disease or chronic and degenerative processes may be detected. It is also essential that the history and physical findings be correlated with the laboratory data that are obtained. This may be exemplified by the significance of fatigue and weakness, which are complained of by some older patients who are markedly anemic. The most common cause of this clinical picture is loss of blood from the gastrointestinal tract, which should be thoroughly investigated.

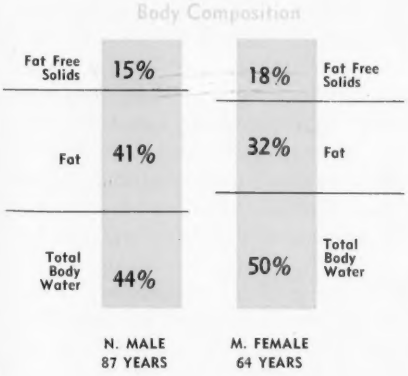
WEIGHT LOSS

Weight loss is an important consideration and should be determined as accurately as possible when the history is obtained. Acute weight loss over a few days is largely a reflection of loss of body water; however, chronic weight loss over weeks or months indicates depletion of body stores of fat and protein.

The body compartments in the elderly patient correspond closely to those of younger individuals if significant losses have not occurred. While the methods that are employed for determination of the body compartments are not generally applicable to routine laboratories, the information that has been obtained from these studies provides an understanding of the physiologic alterations that may be expected when weight loss or abnormal fluid shifts have occurred.

When significant weight loss occurs, certain changes in body composition take place as shown in the illustration (page 271). These changes may be expected in patients with malignant lesions of the gastrointestinal tract which interfere with the normal dietary intake. Concomitant with loss of body weight,

there is a loss of body fat and a diminution of body protein stores. There is a decrease in total body water and total blood volume, although the proportion of body water to body weight increases. Major body weight loss due to nutritional deficiency is associated with a reduction in intracellular water and a decrease in total exchangeable potassium. Thus, when measurements are made in the depleted state, there is an increased extracellular fluid volume and increased plasma volume with a decreased intracellular fraction. Blood loss may further complicate the picture; however, the significant aspect of these changes is that the abnormal body compartmental distribution is not caused by fluid or electrolyte imbalance but rather by deficit in lean tissue mass or body protoplasm. Injudicious administration of water and salt will increase the problems produced by these shifts. Correction by means of sufficient calories, protein, and red cells is required. Operation should be postponed until improvement is obtained, because surgical trauma will increase the hypotonicity of the body in the depleted state.



Effect of loss of body weight on body composition. The 87-year-old man weighed 84 kg. and had lost approximately 3 kg. before the studies were made. The 64-year-old woman weighed 66 kg. and had lost 23 kg. during a nine-month period. The significant changes are the increase in total body water and decrease in body fat in the woman. Total body water was determined with deuterium oxide. Fat was calculated as % fat = 100 — % TBW/0.732. fat-free solids = body weight — (body fat + TBW).[1]

BLOOD VOLUME

A diminished blood volume caused by blood loss is frequently encountered, often without the complications of the nutritional deficits which have been mentioned. Restoration of blood volume is essential in elderly patients who are to be subjected to major operative procedures. Determination of blood volume should be performed in the majority of geriatric patients who are to undergo such procedures. The Evans Blue Dye (T-1824) method is satisfactory and can be employed in most hospitals. Attention should be paid to the proportion of red cells and plasma as well as to the total blood volume. Following acute blood loss, the red cell deficit persists for a longer period of time than does the plasma deficit. In such instances, the use of packed red cells is effective. Overtransfusion is a danger in older persons; when deficits exist and whole blood is indicated in the elderly patient with borderline cardiac reserve, small daily transfusions of 250 cc. each given slowly are safer than rapid replacement.

FLUID AND ELECTROLYTE BALANCE

Preparation of the large bowel for operation, while possessing many attributes from the standpoint of reduction of the bowel flora, has the disadvantage of challenging the fluid balance of the elderly patient. Cleansing enemas and cathartics cause significant losses of fluid containing quantities of sodium and potassium. There is also loss of bicarbonate and chloride; however, there is fre-

quently a greater loss of sodium than chloride so that hyperchloremic acidosis may appear as the result of preparation of the bowel. The frequent diminished renal function may not permit prompt compensation for these abrupt fluid and electrolyte shifts. Not only is adequate fluid needed but additional sodium bicarbonate or sodium lactate is required to correct such hyperchloremic acidosis.[4] The successful management of patients during the operative procedure demands careful attention to hemostases and accurate replacement of blood. The chief hazards during surgical procedures in older patients are circulatory in nature. Shock or hypotensive episodes are poorly tolerated. Decrease in effective circulating blood volume is frequently associated with cerebrovascular accidents and coronary occlusion. Adequate oxygenation is essential at all times during the operation. Anoxia is a potent predisposing factor for cardiac arrest, particularly in a patient with an irritable myocardium or impaired coronary artery flow.

Pulmonary Complications

Among the most frequent complications after operation are those that are pulmonary in nature. Prevention of these problems begins as soon as the operative procedure is completed. Tracheobronchial suction by the anesthetist prior to extubation and oropharyngeal suction in the immediate postoperative recovery period are basic methods for maintenance of ventilatory exchange. It is often safer to leave the endotracheal tube in place at the end of the operation until the patient reacts to its presence.

Narcotics must be used with caution in older patients. The usual dosage of morphine may produce profound depression, particularly in respiratory exchange. For the majority, Demerol, in 25 to 50 mg. dosage every three to four hours, is adequate to control pain and allay restlessness without adverse effect upon respiratory or circulatory function.

An aid in decreasing the incidence of pulmonary complications has been the use of gastrostomy in association with abdominal operations. The introduction of a Foley catheter into the stomach can be readily accomplished and does not significantly prolong operating time. It is advisable to use a nasogastric tube as well until the patient is free of nausea. In patients who may require postoperative gastrointestinal intubation for two or more days—for example after intestinal resection—gastrostomy tubes function well and provide freedom from the problems associated with the prolonged use of nasogastric tubes.

Despite preventive measures, there may still be difficulty with tenacious sputum and atelectasis. Forceful coughing must be encouraged and tracheal suction resorted to if coughing is ineffectual. The use of inhalations of Alevaire or pancreatic dornase are helpful.

Response to Surgery

The metabolic response to surgery in elderly patients is similar to that of the younger age group. There are certain important aspects of the metabolic response that have particular influence upon the management of these patients after operation and are especially important if cardiac or renal function is impaired. After operation, the increased elaboration of antidiuretic hormone (ADH) by the posterior pituitary enhances the reabsorption of water by the renal tubules and produces increased

water retention in the postoperative period. Adrenal hormones, principally aldosterone, are also secreted in increased amounts and result in retention of sodium. Basic fluid requirements therefore are limited to not more than 1,000 cc. to cover insensible water losses and not more than 1,500 cc. to provide sufficient water for urine formation to excrete nitrogenous waste products. Not more than 500 cc. of this should be isotonic sodium. As soon as urinary output is assured, potassium should be added to infused fluids, from 40 to 60 mEq. daily, to provide for the losses of potassium that occur. Extrarenal losses of fluid, such as gastric drainage, should be replaced by volume with appropriate solutions in addition to the quantities outlined.

Daily weight is a valuable aid in determination of hydration of the patient after operation. The patients should be weighed nude, at the same time each morning, and after voiding. Following major operation, a weight loss should be anticipated. In our laboratory, Paquin has found that this weight loss approximates 4 gm. per kilogram of body weight per day after major surgical trauma.[5] If weight loss does not occur by the third or fourth postoperative day, overhydration should be suspected and the administration of fluids should be curtailed. Overzealous administration of fluids is one of the common causes of cardiac decompensation in the aged during the postoperative period.

Conclusions

The response to operation of the depleted patient differs from that of the normal. Operation should, if possible, be postponed in depleted patients until the body stores have been at least partially restored and body compartments are more normal in distribution. The depleted patient has been found to have a marked increase in the extracellular fluid compartment with a concomitant decrease in the intracellular compartment. Operation under these circumstances will further exaggerate this abnormal composition pattern and increase the hypotonicity of the body; cardiac failure and renal failure result. If operation must be undertaken in a depleted or partially depleted patient, parenteral nitrogen administration is effective with minimal caloric supplies. Protein hydrolysates are useful in the immediate postoperative period in such patients. The recent addition of fat emulsions seems to provide calories that enhance the effectiveness of such therapy under these conditions.

Presented at the Postgraduate Course of the Chicago Medical Society, November 4, 1958.

REFERENCES

1. LA DUE, J. S.: Evaluation and preparation of patient with degenerative cardiovascular disease for major surgery. Bull. New York Acad. Med. 32: 418-435, 1956.
2. SHOCK, N. W.: Some physiological aspects of aging in man. Wesley M. Carpenter lecture. Bull. New York Acad. Med. 32: 268-283, 1956.
3. EDELMAN, I. S., and associates: Further observations on total body water. Normal values throughout life span. Surg., Gynec. & Obst. 95: 1-12, 1952.
4. ROBERTS, K. E., J. J. DE COSSE, and H. T. RANDALL: Fluid and electrolyte problems in surgery of aged. Bull. New York Acad. Med. 32: 180-189, 1956.
5. PAQUIN, A. J., JR.: Rate of body weight loss following surgical stress of uniform intensity. Ann. Surg. 141: 383-387, 1955.

The pessimism of the medical profession toward the treatment of pulmonary emphysema today is unwarranted. At least 23 different therapeutic approaches are available, which, alone or in various combinations, can provide some relief for the majority of these patients. Most important of all, however, is the genuine interest of the physician treating the patient.

Improvement in the management of patients with pulmonary emphysema

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BUFFALO

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Pulmonary emphysema is regarded with undue pessimism today by the medical profession. This is reflected by the unfortunate patients who come in to the physician's office with a resigned attitude after having already been told by several doctors that nothing much can be done for their emphysema. Our experience does not support such a dire concept, and, furthermore, nothing does these patients more harm than this hopeless attitude.

Recent developments in the understanding of pulmonary emphysema and progress in therapeutics of the disease state have given us at least 23 different types of treatment for consideration. Some are more helpful than others, and, naturally, some patients respond to one form of therapy more than another. More frequently, a combination of small benefits from several measures can collectively produce gratifying results.

Improvement in this disease does not necessarily need to be great, as measured by objective pulmonary function tests, to produce significant subjective results. Many of these patients, particularly when first seen, are in a state of delicate pulmonocardiac balance which has been decompensated by some recent insult, such as an upper respiratory infection, early pulmonary edema, or a minor aggravation of chronic bronchospasm. Like a bank depositor with low reserve, whose good credit is demolished by overdrawing a few dollars, so these patients can be incapacitated by a small increment in pulmonary disease. Therefore, it stands to reason that restoration of even a small amount of physiologic pulmonary function will be very beneficial for the person who is suffering from pulmonary emphysema.

Furthermore, the usual progression of the basic parenchymal changes has been demonstrated in the classic study of Baldwin and co-workers to be very slow.[1] Therefore, respiratory compensation can frequently be maintained for long periods, even though the margin of such compensation is a preciously narrow one.

Pulmonary emphysema remains an entity which defies exact etiologic and pathologic definition.[2] Dayman's now classic check-valve hypothesis[3] and, more recently, McLean's chronic inflammation theory[4] offer at least partial explanations, but agreement on this is still wanting. In spite of this, there is a group of well-known factors associated with the underlying parenchymal change which make for a syndrome, with varying degrees of each in the individual patient. They are: (1) infection, (2) bronchospasm, (3) emotional response, (4) air trapping, (5) pulmonary secretion, and (6) right heart failure. Admitting that the basic parenchymal destruction cannot effectively be altered, these complications are amenable to therapy. Furthermore, since they are present in the vast majority of so-called pulmonary emphysema patients, most of these patients can be helped to some extent.

There are at least 23 different measures to combat pulmonary emphysema in today's therapeutic armamentarium. The following are listed somewhat in the order of their effectiveness as we have used them.

1. Bronchodilator agents.
2. Anti-infection agents.
3. Stop smoking.
4. Adrenal steroids.
5. Intermittent positive pressure breathing.
6. Slower life tempo.
7. Emotional control.
8. Heart failure therapy.
9. Expectorants.
10. Avoid irritants.
11. Venesection.
12. Radioactive iodine.
13. Dry climate or dehumidification.
14. Allergy control.
15. Diamox.
16. Judicious oxygen therapy.
17. Abdominal support.
18. Artificial pneumoperitoneum.
19. Abdominal exercises.
20. Hyperventilation.
21. Surgery.
22. Control of associated diseases.
23. Progesterone.

1. Bronchodilator Agents

All patients except those with completely dry emphysema will have some degree of bronchospasm at various times. This is undoubtedly related to the frequent bronchial infections, irritation of coughing, smoke or environmental factors, emotional tension, and even atmospheric pressure. Bronchodilator drugs have had considerable success in this disease if properly administered.

Three routes of administration—aerosol, oral, and rectal—are employed, alone or in combinations. Use of an aerosol spray (Isuprel, ephedrine, epinephrine, norepinephrine, and so on) at short intervals as required is effective for immediate relief of bronchospasm. This can be administered by hand nebulizer, by mechanical propulsion, or from a gas pressure source such as a tank of compressed air or oxygen.

The aerosol effect is immediate but of short duration. To minimize the frequency of aerosol medication and provide bronchodilation over a more lasting period, oral medication is effective. Ephedrine and aminophylline, alone or in combination (Amesec, Amodrine, and Tedral are commercially available combinations), are prescribed every four hours. For still more lasting effect, particularly throughout the night, aminophylline suppositories are effective. Aminophylline remains an excellent agent for relief of bronchospasm for those patients who can tolerate it.[5]

The combination of aerosol, oral, and rectal bronchodilators is usually satisfactory and gives dependable relief of bronchospasm over prolonged periods of time.

2. Anti-Infection Agents

The concurrence of infection in patients with emphysema is so frequent that the British call this syndrome chronic bron-

chitis more frequently than emphysema. Its presence is dangerously minimized in these patients because of the usual lack of fever, leukocytosis, and significant pathogenic flora in the sputum culture. The mechanisms of pulmonary emphysema provide a decidely inferior "bronchial toilet," with resultant pooling of secretions in the lower respiratory tract. This provides an ideal medium for bacterial growth which, in turn, produces more infection with bronchospasm and mucous secretion—and the vicious cycle is in orbit. Fever and leukocytosis are not prominent, since these areas are not contained like an abscess nor are the flora productive of consequential toxins. However, the mechanical and inflammatory effects are as real, if not the same, as the usual systemic manifestations of infection. They are real in their mechanical obstruction and aggravated bronchospasm, the very factors which decompensate emphysema patients.[6]

The use of proper antibiotics, as determined by sputum culture and sensitivity tests, can be singularly effective in these individuals. The choice of the hypodermic, oral, or aerosol route is determined by the particular drug, patient status, and eventual response.

Prophylactically, the sulfa combinations have been effective in minimizing bronchial infections and their more serious complications.

3. Stop Smoking

Patients with pulmonary emphysema are so often smokers that evidence has been presented to incriminate smoking as a cause of this disease.[7] Whether this is fact or not remains to be determined. However, there can be no doubt clinically that smoking is a frequent offender in patients with pulmonary emphysema. Measurements of the mechanics of respiration have demonstrated an immediate, statistically significant increase in airway resistance after smoking in emphysematous patients.[8] Increased sputum and bronchial irritation combine with the bronchospasm as further deleterious effects from smoking.

Singularly good symptomatic results have been obtained in many emphysema patients who are able to stop smoking. Just how to get such a patient to stop smoking is the big problem. The support of tranquilizers during such attempts has been helpful.

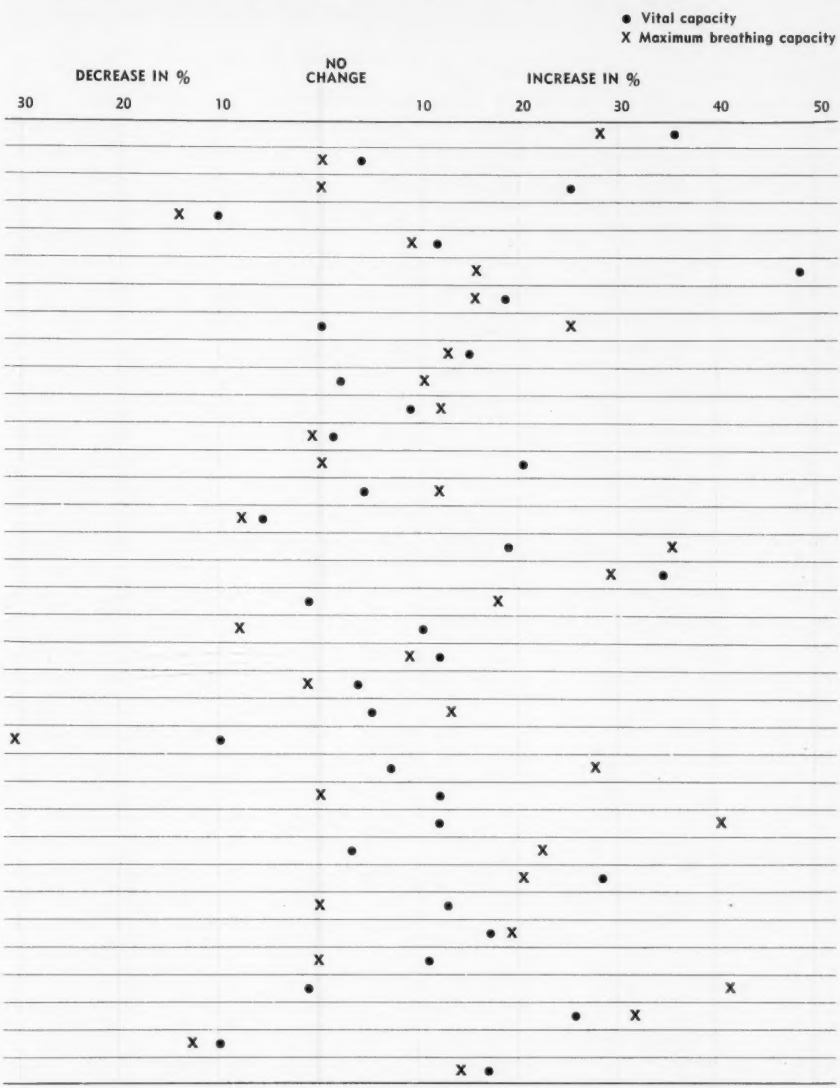
4. Adrenal Steroids

The use of these progressively more numerous and effective hormone preparations has been a real blessing for many patients with emphysema.[9] How they accomplish relief in this disease syndrome has not yet been satisfactorily explained. Dosages are adjusted to the patient's symptomatic requirements but limited by the usual physiologic side effects. Their use in emphysema requires special consideration for the increased frequency of peptic ulceration associated with chronic pulmonary emphysema. [10,11] A concern for dissemination of pulmonary tuberculosis in these patients must also be kept in mind when corticosteroids are given.

5. Intermittent Positive Pressure Breathing

Postwar engineering and medical interest have led to the development of excellent mechanical devices for aerosol therapy under pressures which vary to affect ventilation. While this principle is not new, the recent introduction of a refined apparatus has reopened general interest

EFFECT OF IPPB/1* & BRONCHODILATOR IN EMPHYSEMA



*Intermittent positive pressure breathing on inspiration only.

Improved V. C. 77% M. B. C. 63% Subjective 83%

Pulmonary function determinations for 35 patients following fifteen minutes of intermittent positive pressure therapy with Alevaire and Isuprel on the Pulmonary Ventilator. Each horizontal combination of symbols represents the results in a single individual.

in the use of intermittent positive pressure breathing (IPPB) in various pulmonary disorders, and particularly in emphysema.[12] Complete agreement on the physiologic effects and value of IPPB has not been reached, and a review of these aspects will be presented shortly.[13] We have found it particularly helpful in the management of difficult problems in emphysema. Its effectiveness for the prevention and management of pre- and postoperative pulmonary complications in these patients has been outstanding.[14]

Generally, treatment consists of fifteen-minute periods of intermittent positive pressure breathing with aerosol (bronchodilator, detergent, or antibiotic) four times a day or at the comfort and convenience of the patient. As can be seen in the accompanying figure, ventilatory improvement is frequently apparent after one such period on the machine, although some patients may require several weeks or months of such therapy before improvement is noted.[15] It is a safe procedure in most cases of emphysema and has now achieved widespread use throughout the country.[16]

6. Slower Life Tempo

There is no "cure" for the structural damages of pulmonary emphysema. Patients must be encouraged, but realistically so. Their welfare and confidence are best served by helping them to adjust their living pattern to their disease. This frequently is the most difficult aspect of emphysema, especially for the wage earner. Careful and thoughtful consideration of the problem with the patient can frequently help him to adjust to the inexorably slower pace. To help him understand that to go the same distance at half the speed and without discomfort will reduce his work of breathing greatly with resultant dividends.[17]

7. Emotional Control

This is perhaps the single most underrated element in the care of emphysema patients. It is generally not appreciated how much actual bronchospasm can develop in these people as a result of emotional tension. As in many individuals with bronchial asthma, there exists a real somatopsychic relationship. A successful pharmacologic improvement can be negated in short order by an emotional incident. It is important for the physician and his patient to experience and understand this relationship in order to control its effects on the over-all results. Prophylactic and therapeutic use of mild sedation and tranquilizers and even psychotherapy can be very effective in providing better emotional control.

Furthermore, dyspnea is, after all, a subjective symptom. Many patients, particularly women, whose ventilatory capacity is adequate most of the time, have a combined functional and organic "dyspnea." The functional element frequently is the decompensating fraction. Again, the judicious use of tranquilizers, sedatives, and psychotherapy can be of immense help to these patients.

Finally, the very important reaction of all persons to the distress of a disease like emphysema must be considered. To live with the fear of death from "suffocation" is cause for emotional reaction of any degree. It is most important that the physician see this from the patient's viewpoint. A frank discussion of the disease, its manifestations, its slow course, and the infrequency of suffocation as a cause of death can do much to allay panic, either subliminal or actual, particularly at times of distress.

These patients, like any chronically ill

in emphysema, the welfare and confidence of the patient are best served by helping him to adjust his living pattern to the disease.

individual, are grateful for any explanations and continued interest that can be provided for them. In this regard, it is most important never to reach the end of the therapeutic armamentarium. Always have *something* more to offer—if it will provide nothing more than hope for the suffering individual.

As a final note, it is important to point out that some of the emotional and neurologic changes seen in emphysematous patients are on the basis of an excessive accumulation of carbon dioxide in the system. Neurologic disease and even brain tumors have been mistakenly diagnosed on this basis.[18]

8. Heart Failure Therapy

The eventual complication in a large segment of patients with emphysema is the development of cor pulmonale. Kerley has maintained also that there are many patients with primary heart failure masquerading as bronchitic and asthmatic patients.[19] Therefore, it becomes worthwhile to suspect the possibility of some cardiac failure in the dyspnea of emphysema. Frank signs of cardiac failure are not always obvious and frequently are masked. The use of diuretics, even empirically, is enough on occasion to balance respiratory compensation. The use of digitalis on the same premise has resulted in similar improvement in some patients. This element is to be looked for at all stages of the emphysema patient's progress, with the anticipation that sooner or later it is likely to be an amenable source of clinical improvement.

9. Expectorants

The time honored use of SSKI—saturated solution of potassium iodide—and the other expectorants is never to be overlooked. They are still true friends in the management of emphysema and its concomitant problems. The difficulty of raising sputum even in small quantities is a plague to these patients. Physiologically and subjectively, they are improved by anything that will help in that dilemma.

10. Avoid Irritants

While smoking is the principal irritant offender, there are enough other such elements in the modern environment to be of real menace. Some patients in particularly dusty trades, such as welding, grain handling, and mining, are subject to excessive dust and can be markedly relieved by an adjustment in the environment. A change of job is sometimes feasible. More frequently, attempts to improve the dust conditions in the patient's same location are rewarding.

11. Venesection

The secondary polycythemia in emphysema presents a physiologic dilemma. Phlebotomy in these patients can aggravate the very factors which are producing the polycythemic response.[20,21] However, the test of time has empirically demonstrated the significant value of this procedure, temporary as it may be, in some cases. A cautious and judicious trial of phlebotomy will establish its po-

sition for the individual patient. Obviously, its value is limited to only those patients who have a significant degree of secondary polycythemia.

12. Radioactive Iodine Therapy

In a disease where the respiratory system is unable to supply the oxygen needs of the body, it is worthwhile to consider the possibility of decreasing the oxygen requirements. Hurst and others have reported success with the production of a hypothyroid state in patients with pulmonary emphysema.[22] The results are not uniform, but significant improvement in the comfort of some of these patients has been achieved by the use of radioactive iodine to decrease the metabolic demands.

13. Warm, Dry Atmosphere

One of the fascinating aspects of patients with pulmonary emphysema is the frequent association of their symptoms with barometric and weather conditions. Many of them can predict stormy weather better than the weather bureau. They even complain that bathing is a particularly distressing activity, and many are aggravated in damp coastal areas.

Furthermore, the seasonal frequency of outpatient and office visits by these patients is testimony to the fact that they improve during the summer months. Friend has documented this with pulmonary function tests.[23] Recognition of this provides a therapeutic approach for those patients who can arrange to live in a climate commensurate with their disease. All patients do not respond satisfactorily to a warmer, drier climate, and it is best to advise a trial period in the new region before making any permanent decisions.

Occasionally, the use of a dehumidifier in one section of the patient's home can provide significant benefit, particularly during periods of dampness and low barometric pressure.

14. Allergy Control

It has been asserted that in almost all patients with obstructive emphysema their disease developed secondary to asthma.[24] Furthermore, allergies are well-known offenders in any bronchospastic state.

A careful consideration of possible allergy factors is important in every case of pulmonary emphysema. Significant allergen detection by history, skin testing, elimination diet, and other such methods is worth considering. If an outstanding offender can be determined, the anti-allergic regimens can help. Desensitization, use of autogenous vaccines and antihistamines, and elimination methods are indicated approaches under such circumstances. The results of such therapy vary widely and are dependent on the individual case.

15. Diamox

Another paradoxical agent in the treatment of emphysema is acetazolamide (Diamox), which is a known diuretic and also a carbonic anhydrase inhibitor. The latter action elevates the pCO_2 in the blood, toward hyperchloremic acidosis, the elimination of which is a primary goal in emphysema therapy. However, the drug can also produce improved alveolar ventilation and increased arterial pO_2.

The net effect of all these and possibly other elements probably accounts for the variable response of emphysema patients to Diamox.[25] The response varies, even

in the individual patient, diminishing in its effectiveness as the use of the drug is prolonged. This is not universally true, however, and we have seen an occasional case in sustained remission from the use of Diamox. Certainly a trial of 0.250 gm. every six hours for several days is warranted. Its combination with aminophylline is also effective.[26]

16. Judicious Oxygen Therapy

The hypoxia and eventual cor pulmonale of the emphysematous patient demand oxygen therapy. However, the chronic retention of carbon dioxide may narcotize the respiratory center to insensitivity in some cases, which establishes a physiologic state in which oxygen has a paradoxical effect. In such instances, oxygen therapy diminishes the only remaining stimulus (anoxia) for respiration, and the patient's condition deteriorates into coma, delirium, apnea, and even death.

This oxygen paradox is now well-known clinically and its dangers widely understood. Perhaps it has received too much consideration. Fear of the paradoxical effect has developed an excessive conservatism toward oxygen therapy in some patients. The oxygen paradox is seen only in a small percentage of emphysema patients and can be detected if the patient is carefully watched, especially during the early use of oxygen. To deprive an hypoxic patient of oxygen may be just as deleterious as the oxygen paradox effect. The number of patients needing oxygen far outnumbers those for whom such treatment is dangerous.

Oxygen, judiciously used in a variety of methods—intermittently in slowly increasing amounts or with automatic ventilators and so on—is still important therapy for patients who suffer from pulmonary emphysema.

17. Abdominal Support

A basic problem in pulmonary emphysema is the increased residual air, much of it in bullae at the lung bases. The diaphragm is notoriously depressed and hindered in such patients. A properly fitted abdominal support to effect elevation of the diaphragm can be very helpful. Of even more benefit is the support it provides for coughing.

A tight-fitting sheet folded around the abdomen, an abdominal binder with some filling anteriorly, or even hand pressure in an upward, inward direction on the patient's abdomen are simple measures used to determine if an abdominal support is effective before investing in a specially designed emphysema belt. However, it is important that such homemade measures be given at least several days trial before abandoning the support idea entirely.

18. Artificial Pneumoperitoneum

One of the earliest methods to produce elevation of the diaphragm from its low position in emphysema was the administration of intraperitoneal air. Its use has been carefully studied and deemed effective, particularly in patients with moderate emphysema, below the age of 40.[27] Inconvenience has probably limited very widespread use of this procedure today.

19. Abdominal Exercises

Breathing exercises have been used to produce significant benefit in patients with chronic pulmonary emphysema,[28, 29] while others have found no such improvement in ventilatory function.[30, 31] This disparity awaits settlement and may be related to the selection of patients. Perhaps the attitude and methods of the coach and his subject are determining factors. Enthusiasm for, and understanding of, the methods are most important in the success of abdominal exercises.

20. Hyperventilation

Patients with advanced pulmonary emphysema may accumulate carbon dioxide in their bodies to levels of toxicity. At such a point, their disease makes adequate ventilation, much less hyperventilation, impossible. Mechanical assistance has been singularly effective in some cases where all other measures have failed to reduce the hypercarbia.[32] In most cases, the application of hyperventilation must be maintained for several days before improvement is accomplished. The Drinker respirator, various intermittent positive pressure ventilators, or chest body respirators have been used for this purpose.

21. Surgery

Interest is again reviving in the surgical therapy of pulmonary emphysema. The value of resecting isolated blebs or localized areas of emphysema in the proper patients has long been recognized.[33] More radical methods of tailoring the parenchyma of the overexpanded lung are now undergoing trial[34] and study,[35] with some favorable implications.

The multiple pathologic changes in patients with pulmonary emphysema make classification and therefore evaluation of results somewhat complicated. This is an active field today with tremendous potential for the future.

22. Control of Associated Diseases

It is particularly important in the treatment of pulmonary emphysema to recognize symptoms *not* directly related to the disease itself. Pain, for example, is a rare symptom in emphysema. Its presence should suggest consideration of pneumothorax or peptic ulceration, which are thought to occur more frequently in these patients. Often, the relief of these conditions will be of significant aid in the emphysema problem.

23. Progesterone

Recent reports have suggested the use of progesterone (0.050 gm. per day) for the treatment of pulmonary emphysema.[36] Our own use of it so far has not been enough to warrant judgment of its value.

Discussion

This list makes a fairly sizeable variety of therapeutic agents for the treatment of emphysema. Undoubtedly, there are even more with special indications. In spite of these, however, there is still a small percentage of emphysema patients with so-called "dry emphysema" in whom the parenchymal "degeneration" is the single factor in their decompensation. Treatment of this group has not been very gratifying. However, if the developments of the last ten years are equaled in the next decade, there should be no room for despair for even these pulmonary cripples. Eventually, perhaps, the pathophysiologists will even provide a clue for the prevention of pulmonary emphysema.

Finally, there is an ingredient implied in the whole approach to this disease which cannot be overemphasized. In any chronic disability, the patient's personality sooner or later is intimately involved in the disease status, and this is particularly true in patients with pulmonary emphysema. It has even been suggested that there is a personality "pattern" in these patients, which just emphasizes the importance of the personality in treating the disease.

This demands one fundamental thing from the physician handling the case.

He must have a genuine *interest* in the patient and his disease. If the doctor is not interested or is distressed by the problems of emphysema this is sooner or later communicated to the patient. There are definite organic reflections of this attitude. The converse is equally true. If the doctor is concerned, hopeful, and enthusiastic, this too has tremendous therapeutic implications. Any physician who despairs in the treatment of emphysema will do himself and his patient a favor by letting someone else handle the problem.

The Pulmonary Ventilator (page 277) is manufactured by the Mine Safety Appliances Company.

REFERENCES

1. BALDWIN, E. de F., A. COURNAND, and D. W. RICHARDS, JR.: Pulmonary insufficiency; study of 122 cases of chronic pulmonary emphysema. Medicine 28: 201, 1949.
2. The Aspen conference on pulmonary emphysema, June 1958.
3. DAYMAN, H.: Mechanics of airflow in health and in emphysema. J. Clin. Invest. 30: 1175, 1951.
4. MCLEAN, K. H.: Pathogenesis of pulmonary emphysema. Am. J. Med. 25: 62, 1958.
5. SWEET, H. C., B. W. PEDEN, W. F. KISTNER, and J. G. MUDD: Effect of aminophylline on the emphysematous patient. Missouri Med. 55: 1079, 1958.
6. JONES, R. S.: Airway pressures and ventilation in emphysema during and after respiratory infections. Thorax 13: 42, 1958.
7. LOWELL, F. C., W. FRANKLIN, A. L. MICHELSON, and I. W. SCHILLER: Chronic pulmonary emphysema, a disease of smokers. Ann. Int. Med. 45: 268, 1956.
8. EICH, R. H., R. GILBERT, and J. H. AUCHINCLOSS, JR.: Acute effects of smoking on the mechanics of respiration in chronic obstructive pulmonary emphysema. Am. Rev. Tuberc. 76: 22, 1957.
9. BICKERMAN, H. A., G. J. BECK, and A. L. BARACH: The use of prednisone (Meticorten) in respiratory disease; pulmonary emphysema and pulmonary fibrosis. J. Chron. Dis. 2: 247, 1955.
10. GREEN, P. T., and J. C. DUNDEE: Assocation of chronic pulmonary emphysema with chronic peptic ulceration. Canad. M. A. J.: 67: 438, 1952.
11. WEBER, J. M., and L. A. GREGG: Coincidence of benign gastric ulcer and chronic pulmonary disease. Ann. Int. Med. 42: 1026, 1955.
12. NOEHREN, T. H.: The use of intermittent positive pressure therapy in various pulmonary disorders. New York J. Med. 55: 2143, 1955.
13. BRANDL, E., and T. H. NOEHREN: Intermittent positive pressure breathing: A review. In preparation.
14. NOEHREN, T. H., J. E. LASRY, and L. LEGTERS: Intermittent positive pressure breathing (IPPB/I) for prevention and management of postoperative pulmonary complications. Surgery 43: 658, 1958.
15. MOTLEY, H. L., and R. H. SMART: Pulmonary emphysema: physiologic factors in diagnosis and advances in therapy. J. Am. Geriatrics Soc. 3: 637, 1955.
16. SMART, R. H., C. K. DAVENPORT, and G. W. PEARSON: Intermittent positive pressure breathing in emphysema of chronic lung diseases. J.A.M.A. 150: 1385, 1952.
17. MCILROY, M. B., and R. V. CHRISTIE: Work of breathing in emphysema. Clin. Sc. 13: 147, 1954.
18. AUSTEN, F. K., M. W. CARMICHAEL, and R. D. ADAMS: Neurologic manifestations of chronic pulmonary insufficiency. New England J. Med. 257: 579, 1957.
19. KERLEY, P.: Lung changes in acquired heart disease. Am. J. Roentgenol. 80: 256, 1958.
20. LEWIS, C. S., JR., A. J. SAMUELS, M. C. DAINES, and H. H. HECHT: Chronic lung disease, polycythemia and congestive heart failure; cardiorespiratory, vascular and renal adjustments in cor pulmonale. Circulation 6: 874, 1952.
21. AUCHINCLOSS, J. H., JR., and J. J. DUGGAN: Effects of venesection on pulmonary and cardiac function in patients with chronic pulmonary emphysema and secondary polycythemia. Am. J. Med. 22: 74, 1957.
22. HURST, A., M. H. LEVINE, and D. R. RICH: Radioactive iodine in management of patients with severe pulmonary emphysema. Ann. Allergy 13: 393, 1955.
23. FRIEND, J.: The variability of ventilatory function in emphysema. Clin. Sc. 13: 491, 1954.
24. ALTSCHULE, M. D.: Physiology in Diseases of the Heart and Lungs. Cambridge: Harvard University Press, 1954.
25. BELL, A. L. L., JR., C. N. SMITH, and E. ANDREAE: Effects of carbonic anhydrase inhibitor "6063" (Diamox) on respiration and electrolyte metabolism of patients with respiratory acidosis. Am. J. Med. 18: 536, 1955.
26. GALDSTON, M., and J. GELLER: Effects of aminophylline and Diamox alone and together on respiration and acid-base balance and on respiratory response to carbon dioxide in pulmonary emphysema. Am. J. Med. 23: 183, 1957.
27. ZAK, G. A., and N. SOUTHWELL: Investigation into treatment of pulmonary emphysema with artificial pneumoperitoneum. Acta. Med. Scandinav. 147: 79, 1953.
28. MILLER, W. F.: Physiologic evaluation of effects of diaphragmatic breathing training in patients with chronic pulmonary emphysema. Am. J. Med. 17: 471, 1954.
29. BARACH, A. L.: Restoration of diaphragmatic function and breathing exercises in pulmonary emphysema. New York J. Med. 56: 3319, 1956.
30. CAMPBELL, E. J. M., and J. FRIEND: Action of breathing exercises in pulmonary emphysema. Lancet 1: 325, 1955.
31. SINCLAIR, J. D.: Effect of breathing exercises in pulmonary emphysema. Thorax 10: 246, 1955.
32. NOEHREN, T. H.: Relief of carbon dioxide narcosis by simple intermittent positive pressure therapy. Dis. Chest 28: 515, 1955.
33. WEISEL, W.: Surgical treatment of localized emphysematous disease. Ann. Surg. 142: 17, 1955.
34. BRANTIGAN, O. C., and E. MUELLER: Surgical treatments of pulmonary emphysema. Am. Surg. 23: 789, 1957.
35. FITZPATRICK, M. J., C. F. KITTLE, T. K. LIN, and D. BRUKARDT: Prolonged observations of patients with cor pulmonale and bullous emphysema after surgical resection. Am. Rev. Tuberc. 77: 387, 1958.
36. TYLER, J. M.: The effect of progesterone on the respiration of patients with emphysema and hypercapnea. Clin. Res. 5: 229, 1957.

Practical pulmonary function testing for the practicing physician

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The more common tests of pulmonary function currently available to the practicing physician are reviewed. Through accurate diagnosis, adequate therapy can be instituted, and, with adequate therapy, better control of chronic pulmonary diseases and more effective patient care can be obtained.

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■ The full evaluation of the patient is all-important in the practice of medicine. In this evaluation, pulmonary function testing has emerged in recent years from a primarily research activity available only in a few laboratories to a clinical function that is steadily increasing in importance in the diagnosis and management of pulmonary disease.

Introduction

The accessibility of the lungs to physical and roentgenographic examination has permitted fair evaluation of pulmonary disorders for many decades. Occasionally, physical examination, thoracic fluoroscopy, and x-ray examination of the chest do not give enough information, and additional studies may be desired.

During the past ten to fifteen years, physiologic tests of pulmonary function have been developed, and several are considered as important to the practice of medicine as are some of the tests of hepatic, renal, cardiovascular, and neuromuscular function.[1]

Not only have pulmonary function studies been of value in diagnosis of pulmonary disorders but they have also been of great help in guiding and objectively evaluating therapy in these conditions. They aid in quantitating abnormal function in cardiopulmonary disease and also assist in detecting pulmonary involvement in many systemic diseases. Their use has led to more precise knowledge of the pathophysiology and the natural course of pulmonary disease and has provided a better understanding of normal pulmonary physiology in healthy men and women of all ages.

Pulmonary function tests may also be useful in ruling out lung disease in nonorganic types of dyspnea, such as conversion and other psychoneurotic disorders. They may aid in differentiating primary from secondary types of polycythemia and in distinguishing pulmonary from cardiac disease. They have proved useful in the preoperative and postoperative assessment of the patient with known or suspected cardiac or pulmonary dysfunction.

In addition, these tests may be helpful in achieving an objective evaluation of disability claims in insurance or industrial practice and may be useful in preemployment examinations. There are, however, several things that pulmonary function testing cannot do. They can neither supplant a good history and physical examination nor offer a pathologic or etiologic diagnosis. Limitations are present in all tests used in medicine, and pulmonary function testing has not escaped these limitations.[2]

Classification of Respiratory Diseases

The physiologic classification of disease forms as tabulated in table 1 is advantageous in approaching the diagnosis and management of the patient.

Localized disease of the lung, such as carcinoma, tuberculosis, or lung abscess, which often produces dramatic roentgenographic findings, may have little effect upon lung function as measured by conventional methods of testing. On the other hand, generalized disease of the lung, such as pulmonary emphysema and pulmonary fibrosis, may alter significantly pulmonary function but may exhibit minimal abnormality on roentgenographic examination.

In the study of the patient with generalized disease of the lung producing respiratory insufficiency, this classification has proved to be helpful.

Pulmonary Function Tests

It is the purpose of this paper to review briefly some of the pulmonary function tests available. There are many methods of measuring pulmonary function, but only the tests practical for small hospitals or individual clinicians will be discussed here.

HISTORY AND PHYSICAL FINDINGS

The physician is actually evaluating pulmonary function the moment he sees the patient. What does general observation of the patient reveal? Is he barrel-chested? Does he complain of breathlessness on walking into your office? Is the breathlessness out of proportion to the other clinical findings? Does he tell you about *exertional dyspnea,* the hallmark of pulmonary dyspnea? This is the basic and, many times, initial symptom of pulmonary ventilatory insufficiency. What is shown in the general examination? Especially, what do over-all inspection of the patient and palpation, percussion, and auscultation of the thorax reveal?

THORACIC FLUOROSCOPY

Office procedures also help the physician to evaluate pulmonary function. For example, most physicians now have available to them such x-ray equipment as the chest fluoroscope, the use of which is an integral part of pulmonary function studies. Without recourse to spirometer, arterial blood sampling, or gas analyzers, thoracic fluoroscopy enables the physician to observe what respiratory muscles are being used, to approach an estimation of the adequacy of ventilation and the uniformity of the distribution of inspired gas, and to localize the sites of pulmonary disease. Actually, on chest fluoroscopy, the physician can time the forced expiration, which normally lasts for three or four seconds or less. Prolongation of this time occurs in the pres-

ence of *expiratory airway obstruction.* Air-trapping is easily seen on fluoroscopy, particularly after successive forced expirations.

Both the contour and mobility of the diaphragms should also be noted. Normally, it is estimated that the diaphragm accounts for approximately two-thirds of the bellows action of moving air in and out of the lungs, and the costal motion approximately a third. Does the patient have good diaphragmatic movement? This is important as a test of pulmonary function, whereas, although widely used, circumferential chest measurements are not valid alone as a measurement of pulmonary function.[5,6] An inspiratory sniff test should be done to rule out paroxysmal motion of the diaphragm signifying paralysis. Rib movement and width of interspaces should be noted as well as cardiac size and contour, which may be of importance in differentiating cardiac from pulmonary dyspnea.

CHEST ROENTGENOGRAM

Chest roentgenograms will preserve as a permanent record many significant findings seen at fluoroscopy, particularly the inspiratory and expiratory films delineating diaphragmatic mobility. The inspiratory posteroanterior and lateral chest films, which reveal flattened diaphragms in chests with normal or apparently increased lung volume and a low vital capacity, obviously indicate a markedly increased residual volume.[7]

PHYSIOLOGIC TESTS

Physiologic tests in pulmonary function comprise two general groups, the first relating to the bellows action of the chest and lungs for the movement of air in and out of the alveoli (ventilation) and the *distribution of inspired gas* to the alveoli. The second test is concerned with the *diffusion* of gas across the alveolar capillary membrane to and from the blood *perfusing* the pulmonary capil-

TABLE 1

Forms of Respiratory Insufficiency*

Mechanism of external respiration	
	Ventilation insufficency: (i.e., impaired movement of air in and out of the lungs). **A.** Hypoventilation: Restrictive, obstructive, congestive, etc. **B.** Uneven distribution of inspired gas in relation to pulmonary capillary blood flow.
	Diffusion: Impairment of gases across alveolar capillary membranes.
	Perfusion: Impairment of pulmonary circulation. **A.** Uneven distribution of pulmonary capillary blood flow (in relation to alveolar ventilation). **B.** Venous—arterial shunt.
	Abnormalities in erythrocytes or hemoglobin.

* Modified from Comroe,[1] Meneely,[2] Baldwin, Cournand, and Richards,[3] and Motley.[4]

TABLE 2

Pulmonary Function Tests

1.	**Lung volumes:**[3,8] Measurement of primary subdivisions of the lung compartments (see graph in table 3).
2.	**Pulmonary ventilation volume (resting).**[3]
3.	**Mechanical function of breathing:**[1, 3] Emphasis upon the total and timed vital capacity and the maximum breathing capacity; these findings parallel the ventilatory efficiency and over-all mechanical function of the lungs and thorax.
4.	**Distribution of inspired gas:**[3, 9] Measurement of evenness of gas distribution within the lungs.
5.	**Measurement of physical characteristics of the lung:**[10, 11] Normally the lungs are easily distensible (i.e., compliant) and bronchial resistance to airflow is low.
6.	**Diffusion and efficiency of gas transfer across the lung:**[12, 13] Measurement of rate of oxygen diffusion, which may indicate, for example, an alveolar capillary block or the loss of lung surface area exposed to blood.
7.	**Measurement of tension of oxygen and CO_2 in the arterial blood.**[14, 15]
8.	**Direct measurement of pressure in the pulmonary artery.**[16]
9.	**Bronchospirometry:**[17] Measurement of certain aspects of lung function in each lung individually.

laries of the lung. Reference to these and other specialized tests is made in table 2.

VENTILATION

There is now fairly general agreement on the basic equipment and methods needed for testing pulmonary function.[2] The minimal evaluation includes a total and three-second timed vital capacity.[18] The measurement of vital capacity without the estimation of the rate of expiratory air flow is relatively valueless. In the office, this estimate can be accomplished by observing the rate at which the patient expires into the apparatus used for measuring the vital capacity. A gross but important evaluation can thus be made of the rate of expiratory air flow. A more accurate measurement of the maximal rate of expiratory air flow can be made by inspection of the spirometer tracing of expiration made during maximal effort.

The vast majority of patients with pulmonary insufficiency can be evaluated satisfactorily for practical purposes with a spirometer, of which there are many available. In our institutions, the 9.0 and 13.5 liter Respirometers are used. With this type of instrument, the volume of air moved can be measured and timed and the pattern of breathing studied. As aptly stated in the monograph of Comroe and his co-workers,[1] "If vital capacity is reduced greatly, but the maximal volume flow of air is nearly normal, a restrictive lesion probably exists. If vital capacity is nearly normal, but the maximum volume of air is reduced greatly, an obstructive lesion probably exists. Furthermore, these tests, performed before and again after the administration of bronchodilator drugs, are often valuable in determining whether the patient has reversible bronchial obstruction; in this way they are very helpful both in diagnosis and in directing therapy."

The spirometer is by far the most valuable instrument in routine pulmonary function study. The total and timed vital capacity and the maximum breathing capacity findings parallel the ventilatory efficiency and over-all mechanical function of the lungs and thorax. By adding to these findings the determination of the residual volume, one may arrive at the *ventilatory index* as proposed by Motley.[4] If these findings are normal, it is unlikely that the patient has a significant disturbance of ventilatory function and that further tests as carried out in the research laboratory would be of more diagnostic aid only in isolated circumstances.

The maximum breathing capacity is probably the most effective measurement of bellows action. A satisfactory performance is dependent on a patent tracheobronchial airway, normal elasticity of all parts of the lung, and well-coordinated neuromuscular chest movements. A disturbance in any one or in any combination of these factors is reflected in a decreased maximum breathing capacity.

The estimation of the *residual volume* is not used frequently in clinical practice, and facilities for this procedure are usually not available. The residual volume is that volume of air remaining in the lungs after a maximal expiration and is the only one of the lung volumes (table 3) that cannot be measured by direct spirometry; this and the *index of distribution of inspired gas* must be determined by indirect means.[3, 19] However, if available, the measurement of the residual volume and the determination of

TABLE 3

Pulmonary Ventilation Function Studies

Date: _____

Age___ yrs. Ht.___ft.___in.__cm. Wt._____lbs.

Body Surface Area _____ M^2

Ideal Surface Area _____ M^2

I. VENTILATION MEASUREMENTS:

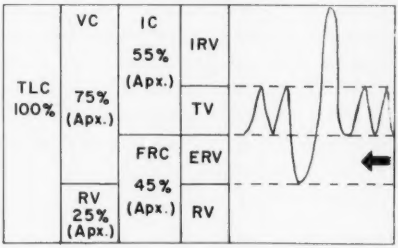
Temp: _____

	Pred.	Observed	% Pred.	After Bronchodilator
(Total) Vital Capacity (VC) total liters				
1 sec. ┐	65 >			
2 sec. ├ Timed VC % of total vol.				
3 sec. ┘	96			
Expiratory Reserve Volume (ERV) in L.				
Inspiratory Capacity (IC) in L.				
Total VC Time sec.	< 4			
Mid-half VC liter-time L./sec.				
Maximum Breathing Capacity (MBC) L./min.				
MBC (on Ideal Body Wt.)				
MBC Baseline Level	0			
(Resting) Minute Ventilation (RMV) L./min.	5-8			
Breathing Reserve (BR) = MBC-RMV L./min.				
BR/MBC X 100	90+			
Air Velocity Index = $\frac{\%\ \text{Pred. MBC}}{\%\ \text{Pred. VC}}$	0.8-1.2			

II. LUNG VOLUME DETERMINATIONS OBSERVED:

Functional Residual Cap. (FRC)in L.	
Expiratory Reserve Vol. (ERV)	
Residual Volume (RV)	
Inspiratory Capacity (IC)	
Total Lung Capacity (TLC)	
RV/TLC X 100	

GRAPH (for Parts I & II):



III. INDEX OF INTRA-PULMONARY DISTRIBUTION*:

Helium Equilibration Time (< 3 min.)

Time	Reading	Time	Reading
1"		3½"	
1½"		4"	
2"		5"	
2½"		6"	
3"		7"	

IV. INTERPRETATION:

Patient's Identification | Reg. No. | Ward

* Of Inspired Gas

the index of distribution of inspired gas have considerable value, particularly in the diagnosis of pulmonary emphysema. Also, various *dyspnea indexes* have been proposed to correlate the incapacity in patients with chronic pulmonary disease, but with variable results.[6]

At times, one is confronted with a situation where a bedside evaluation would be desired or indicated. The vital capacity test can be readily performed at the bedside with a portable bellows-type apparatus. A compact instrument of this type, the Vitalor, has been developed for determining timed vital capacity and maximal expiratory flow rate as well.

The spirographic findings may be recorded conveniently on a data sheet such as that shown in table 3.

The actual cases seen in table 4 demonstrate spirographic findings in the normal patient and in patients with restrictive and obstructive ventilatory insufficiency. As indicated previously by Comroe[1], the total vital capacity and timed vital capacity and maximum breathing capacity, along with the residual volume, are helpful in differentiating the normal from the restrictive and obstructive ventilatory insufficiency patterns. The characteristic findings in each of the two forms of ventilatory insufficiency are illustrated in table 4.

BLOOD GAS STUDIES

The second general group of physiologic tests of pulmonary function pertains in part to gas exchange across the alveolar-capillary membrane.[13] The simplest and most commonly used test of this type is the measurement of the oxygen saturation of arterial blood.

In many pulmonary diseases, there is arterial oxygen unsaturation as seen at rest, after rest, and during exercise. This is particularly observed in pulmonary emphysema. Variations in the carbon dioxide tension of the arterial blood are also important and may be detected in various disease states. For example, in pulmonary fibrosis, a decrease due to overventilation may be observed, while in pulmonary emphysema, because of underventilation of the alveoli, an increase may be seen. The direct measurement of the CO_2 tension is usually not available except in research institutions. However, it may be calculated indirectly from a nomogram after determining the CO_2 content and the pH of arterial blood.[20] Since these technics are not available in most places, the use of the plasma CO_2 combining power may be helpful in detecting chronic elevation of CO_2 tension; caution must be used in interpretation if this is the only measurement available—that is, if there is no simultaneous measurement of blood pH. Recently, a simple instrument has been developed which will permit bedside measurements of alveolar CO_2 tension.[21] Although we have had no personal experience with this instrument, it should prove to be of practical value.

The combination of ventilation and gas studies is available in many places. Added to the physical findings, these tests, together with a well-performed exercise tolerance test, are adequate for the evaluation of most patients with respiratory insufficiency.

With the addition of intermittent positive pressure breathing (IPPB), the differentiation of hypoventilation, diffusion, or perfusion defects producing oxygen desaturation of arterial blood may be made. This is done by obtaining arterial oxygen saturation at rest, after breathing forced compressed air (with

TABLE 4

Common Pulmonary Insufficiency Patterns

Type of insufficiency	Patho-physiology	Chest fluoroscopy	Chest x-ray (inspr. and expir. views)	* Pulmonary ventilation tests: Vital cap. Total †	Vital cap. Timed (3 sec.)	MBC †	Helium distr. index	RV	RV/TLC	Arterial gas studies	Other comments
1. None	Mild upper respiratory infection (URI).	Normal	Normal	133%	92%	83% (107 L. per min.)	Normal (2 min.)	1.35/L.	Normal (20%)	Not indicated	35-yr.-old physician whose follow-up MBC rose to 95% of predicted normal (when clear of URI).
2. Restrictive ventilatory insufficiency	Pulm. fibrosis associated with sarcoidosis.	Good diaphragmatic mobility. Polylobar linear shadows. Emptying time <3 sec.	Diaphragmatic motion adequate. (Better demonstrated here on chest fluoroscopy)	59%	100%	67% (79 L. per min.)	Normal (2 min.)	0.26 L.	10%	Arterial O_2 desat. at rest worsened by exercise & completely overcome by 100% O_2 administration.	Arterial gas studies also suggest diffusion impairment.
3. Obstructive ventilatory insufficiency	Obstruct. pulm. emphysema.	Low, flattened diaphragms. Air-trapping. Expiration time prolonged.	Minimal diagphragmatic mobility with polylobar air-trapping and widened rib interspaces.	66%	81% (47% in 1st sec & 68% in 2nd sec.)	31% (30 L. per min.)	Prolonged (5 min.)	4.0 L.	60%		Pulm. ventilation function tests here indicate type of impairment and reasonable extent of incapacity.
4. Perfusion insufficiency ‡	Pulmonary veno-arterial shunt with secondary polycythemia.		Nodular infiltrate to upper lung field. No air-trapping.	N		N		2.0 L.	31%	Arterial O_2 desat. at rest (91%). Not completely overcome by 100% O_2 administration.	Operation revealed pulmonary hemangioma.

* See table 3 for explanation of abbreviations and normal values.

† Per cent of predicted normal.

‡ Permission by Year Book Publishers, **The Lung,** by J. H. Comroe, Jr.; et al., Case IV, pp. 153-156, 1955.

IPPB), and after breathing pure oxygen for ten minutes. If arterial oxygen desaturation at rest is due to hypoventilation only, breathing compressed air will produce full saturation. Breathing 100 per cent oxygen will fully saturate the blood if the desaturation is on a diffusion defect mechanism. Neither compressed air nor breathing pure oxygen will produce full saturation in a person with a perfusion defect. The other findings of the perfusion defect are tabulated in case 4 in table 4.

ADDITIONAL STUDIES

More elaborate tests for evaluating pulmonary function are available such as those measuring pulmonary compliance, diffusion gradients, work of breathing, air-flow rates, intrapulmonary distribution of inspired gas, and other parameters. The performance of these studies may involve the use of such instruments as infrared gas analyzers, electronic flow meters, and so on. A discussion of these methods is beyond the scope and intent of this paper as such studies are usually carried out in medical research centers. As mentioned previously, the basic references pertaining to these special tests are tabulated in table 2. The *practical tests* for the practicing physician are discussed more fully in this paper.

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The Respirometer (page 288), Warren E. Collins Company; Vitalor (page 290), McKesson Appliance Company.

REFERENCES

1. COMROE, J. H., JR., et al.: The Lung Clinical Physiology and Pulmonary Function Tests. Chicago: Year Book Publishers, 1955.
2. MENEELY, G. R.: Pulmonary function testing. A special exhibit from the Section on Diseases of the Chest of the American Medical Association. Dis. Chest 31: 125, 1957.
3. BALDWIN, E. DEF., A. COURNAND, and D. W. RICHARDS, JR.: Pulmonary insufficiency. I. Physiologic classification, clinical methods of analysis, standard values in normal subjects. Medicine 27: 243, 1948.
II. Pulmonary insufficiency; study of 39 cases of pulmonary fibrosis. Medicine 28: 1, 1949.
III. Pulmonary insufficiency; study of 122 cases of chronic pulmonary emphysema. Medicine 28: 201, 1949.
4. MOTLEY, H. L.: Pulmonary function measurements. Am. J. Surg. 88: 103, 1954.
5. Personal observations.
6. GILSON, J. C., P. HUGH-JONES, P. D. OLDHAM, and F. MEADE: Lung Function in Coalworkers' Pneumonoconiosis. London: Her Majesty's Stat. Off., 1955.
7. EBERT, R. V.: Pulmonary Failure. DM; Disease a Month. Chicago: Year Book Publishers, 1958.
8. PAPPENHEIMER, J. R., et al.: Standardization of definitions and symbols in respiratory physiology. Fed. Proc. 9: 602, 1950.
9. MOTLEY, H. L.: Comparison of a simple helium closed with the oxygen open-circuit method for measuring residual air. Am. Rev. Tuberc. 76: 601, 1957.
10. FRY, D. L., et al.: Measurements of intraesophageal pressure and its relationship to intrathoracic pressure. J. Lab. & Clin. Med. 40: 664, 1952.
11. MCILROY, M. B., R. MARSHALL, and R. V. CHRISTIE: Work of breathing in normal subjects. Clin. Sc. 13: 127, 1954.
MCILROY, M. B., and R. V. CHRISTIE: Work of breathing in emphysema. Clin. Sc. 13: 147, 1954.
12. FILLEY, G. F., D. J. MACINTOSH, and G. W. WRIGHT: Carbon monoxide uptake and pulmonary diffusing capacity in normal subjects at rest and during exercise. J. Clin. Invest. 33: 530, 1954.
13. AUSTRIAN, R., et al.: Clinical and physiologic features of some types of pulmonary diseases with impairment of alveolar-capillary diffusion; syndrome of "alveolar-capillary block." Am. J. Med. 11: 667, 1951.
14. VAN SLYKE, D. D., and J. M. NEILL: Determinations of gases in blood and other solutions by vacuum extraction and manometric measurements. J. Biol. Chem. 61: 523, 1924.
15. RILEY, R. L., D. D. PROEMMEL, and R. E. FRANKE: Direct method for determination of oxygen and carbon dioxide tensions in blood. J. Biol. Chem. 161: 621, 1945.
16. COURNAND, A.: Some aspects of pulmonary circulation in normal man and in chronic cardiopulmonary diseases. Circulation 2: 641, 1950.
17. GAENSLER, E. A.: Bronchospirometry; review of literature. J. Lab. & Clin. Med. 39: 917, 1952.
18. FRANKLIN, W., A. L. MICHELSON, F. C. LOWELL, I. W. SCHILLER: Clinical value of tracing of forced expiration (expirogram); pulmonary disease. New England J. Med. 253: 799, 1955.
MICHELSON, A. L., W. FRANKLIN, and F. C. LOWELL: Clinical value of tracing of forced expiration (expirogram); cardiac disease. New England J. Med. 253: 852, 1955.
19. MENEELY, G. R., and N. L. KALTREIDER: Volume of lung determined by helium dilution; description of method and comparison with other procedures. J. Clin. Invest. 28: 129, 1949.
20. PETERS, J. P., and D. D. VAN SLYKE: Quantitative Clinical Chemistry. Volume 2: Methods. First edition. Baltimore: Williams & Wilkins Co., 1932, pp. 294, 300.
21. RAVIN, A. H., and M. STEIN: Bedside measurement of alveolar carbon dioxide tension. New England J. Med. 259: 811, 1958.

Old people are prone to accident because of many factors—physiologic, psychologic, and pathologic changes of aging as well as certain environmental reasons. Living and working conditions suitable to their age and ability should help reduce the number of accidents, but more important is an appreciation of the disabilities and limitations to be found in the aging process.

Accidents among old persons

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The estimated population of England and Wales in mid-1956 was 44,821,000; of this number, 5,173,000 persons, or approximately 1 in every 9, were aged 65 years or more. Throughout this century there has been a steady increase both in the total number of old people in this country and in the proportion of old people to the rest of the population. It has been estimated by the Government Actuary in consultation with the Registrar General that, within two decades, the number of persons 65 and over will increase by perhaps a further 2 million, with the result that the proportion of old people to the rest of the population will become 1 in 7. Since old people are very prone to accidents, it is important to consider the accident pattern in old age and possible ways of reducing the incidence.

Road Accidents

Old people may have accidents on the roads, at work, and in their homes. It is perhaps not surprising that the number of road casualties is rising, for, since 1930, the number of vehicles on the roads of Great Britain has increased threefold from 2.3 million to more than 7 million at present; furthermore, it has doubled even within the last decade. Although the number of casualties has increased, the number of deaths has not risen commensurately. The number of casualties among old people is growing, and the majority of the victims over 50 are women. Pedestrian casualties are found largely among children, but, with the approach of middle age, the incidence again begins to rise to a maximum among adults in the seventh decade. Fatal pe-

destrian casualties are most frequent among the young and the old, particularly in the age group of 75 to 79 years. For all forms of traffic accident, accident and death rates per million living in each age group are high in those over 70.

Industrial Accidents

The annual report for 1954 of the Chief Inspector for Factories showed that the accident rate in old people aged 65 or more was lower than that for younger age groups.[1] The Chief Inspector suggested that accidents were not so high as expected among old people, possibly because they were engaged in less dangerous employment. He thought that the age of the worker was a relatively unimportant factor in determining a fatal result but that, at the same time, accidents among older people usually involved a longer period of sick leave because of delay in recovery and sometimes appeared to precipitate premature retirement. He considered that most accidents resulted from the stubborn insistance of some old people that they could climb, lift, and pull as well as ever. Accidents among elderly men resulted largely from handling goods and from falls, but, among elderly women, falls, and particularly falls on the level, were the greatest danger.

King and Speakman believed that there might be a tendency for accidents to increase with age when the work was being done under pressure but that, if it were being carried out at a speed at which old people were capable, the accident rate was lower.[2] They found that falls and periods of giddiness tended to increase with age.

Comparisons have been made between accident prone older workers and others of the same age who show the same degree of visual and auditory acuity. Whitfield has suggested that accident prone workers seem to fail to produce the appropriate response to a sudden hazard, even though they are aware of it.[3] Older men with accident records seem to have good, or at least normal, perceptual and cognitive ability but are deficient in motor control, and, with advancing age, there seems to be deterioration of sensory motor performance, so that they are slow to react to an emergency.

The commonest forms of accident to increase with age are falls either from a height or a machine, falls through slipping or tripping on the ground, or injuries from being hit by falling or moving objects. On the other hand, with increasing age there is a diminution of the type of accident which is listed as "caught in a machine" and "inflicted by own tool." In other words, greater care and accuracy seem to be shown with increasing age. All those who have studied this problem maintain that thinking time increases with age and that, although old people can learn to plan and carry out their own activities, if they are forced suddenly to change a planned movement they can only respond slowly and the risk of an accident increases.

Accidents in the Home

It is perhaps understandable that the great majority of accidents occur at home, for that is where most old people, particularly women, spend most of their time. In England and Wales 95 per cent of old people live at home while the remainder are accommodated in hospitals, welfare homes, and nursing homes. However, the census of 1951 showed that one million old persons, three-quarters of whom

TABLE 1

Fatal Home Accidents

England and Wales 1956

AGE GROUP	MEN	WOMEN	TOTAL
0- 4 years	374	314	688 - 10%
5-14 years	49	59	108 - 2%
15-44 years	219	140	359 - 5%
45-64 years	335	379	714 - 10%
65-74 years	401	652	1,053 - 15%
75 years and over	1,138	2,848	3,986 - 58%
Total	2,516 (37%)	4,392 (63%)	6,908

were women, lived at home entirely alone. Local surveys suggest that perhaps 10 per cent of old people at home are housebound. Many of them are frail and infirm and need an increasing amount of assistance from voluntary and statutory sources; this increasing frailty clearly predisposes them to accidents. Table 1 shows that 73 per cent of fatal home accidents involves elderly persons of 65 or more and that more than one-half affect people of 75 or over. The table also shows that in the older age groups women are more commonly the victims.

The accident rate is high in old people at home, and the tendency to accidents increases with age, with the greatest risk in the 80 to 84 year group. Many old people become tired in their struggle to maintain their independence, become forgetful and absent minded, and may undergo a change in personality so that the fastidious become careless. Their attention may be poorly sustained so that they fail to appreciate reckless habits and the dangers associated with modern appliances. Some may become highly acquisitive so that their homes become more congested and consequently more hazardous.

Then there may be physiologic reasons, such as changes in the blood supply and in the substance of the brain, to account for their liability to accident. Failing vision and contraction of the visual field is a particular handicap, especially in bad light; hearing may become diminished and the sense of smell and taste gradually lost. Muscular weakness and a gradual failure of co-ordinating movements are both factors predisposing to accidents.

Old people are fearful of accidents, for the apparently trivial incident can often prove severe, lead to great hardship, and have dire results. The old person tends naturally to adjust his activities to his failing physical powers, and his way of life may be delicately balanced and easily disrupted by a minor accident, with the consequence that he may become dependent on others for his exist-

ence. Therefore, in this country particular attention is being paid to the design of accommodation and equipment for old people, having regard to their physical limitations.

Surveys of old people living at home constantly refer to accidents. During the Wolverhampton survey in 1947, Sheldon was so impressed with the constant reference to accidents that he questioned 400 people specifically about those factors which they believed to have affected their present state of health.[4] The second most common factor to which they attributed a poor state of health was a previous accident.

Not only may accidents cause great hardship to old people themselves, but it is not uncommon to find one-third of the beds in accident wards of hospitals occupied by elderly patients, of whom a considerable proportion are over 75. An analysis of injuries in elderly patients admitted to the Birmingham Accident Hospital revealed that more than one-half of the accidents were of domestic origin; there were about twice as many women as men among the inpatients, a disparity which widened with age. On their recovery, many were not able to continue their independent existence at home, for they needed special accommodation or the assistance of domestic help or home nursing equipment.

Table 2 relates to fatal home accidents in the age group 65 to 75 years and that group 75 years and over. It can be seen that the majority of fatal home accidents affect the very elderly and that women are involved more than men, particularly in the older age group. Three groups of accidents—falls, burns and scalds, and coal gas poisoning—account for 97 per cent of the fatalities. The outstanding hazard to old people in the home is a fall; such accidents account for 80 per cent of the fatalities in the elderly.

FALLS

The onset of falls can cause considerable anxiety. Apart from those which prove fatal, they may result in permanent or serious incapacity with consequent loss of independence. A fracture of the lower limb is a common result, and the average stay in the hospital is perhaps three to four months. It is the policy in this country to enable and to encourage old people to remain at home as long as possible, but it is appreciated that the home is a place in which old people are especially apt to fall. Because of this liability to fall and the steady increase of osteoporosis with age, women are especially prone to fracture of the femur. Fatal falls in the home are more common in the winter months, especially in the first quarter of the year. In the course of a day, there is reason to believe that they occur more frequently in periods of poor light, as at the end of the day. Many falls occur on staircases, but the majority are suffered while the victim is standing or moving on the same level; the shallow step is a special hazard, particularly if it is in a badly lighted area. Elderly people are also apt to fall while getting in or out of bed.

Falls are more frequent in the large towns and least in the country districts. Table 3 demonstrates the variation in mortality rates according to latitude; in both age groups and at all latitudes the rate is higher in women, and in both age groups there is a fall in the rate toward the south.

Two local surveys of old people at home, in Sheffield and Wolverhampton, showed that nearly 40 per cent were liable to falls and that this tendency ap-

TABLE 2

Fatal Home Accidents

Older Age Groups—England and Wales 1956

	65-74 YEARS	75 YEARS & OVER	TOTAL
Poison	25	30	55
Coal gas poisoning	135	310	445
Falls	720	3,269	3,989
Burns and scalds	122	305	427
Suffocation	14	20	34
Electric current	2	2	4
Drowning	10	13	23
Other accidents	25	37	62
TOTAL	**1,053** (Men 401 Women 652)	**3,986** (Men 1,138 Women 2,848)	**5,039**

peared to increase with age. Ten per cent of the victims suffered fractures from these falls; both surveys showed a fairly similar distribution of vertigo in the old people liable to fall.

The causes of falls among old people are varied. A sudden onset may herald illness. Failing vision, labyrinthine failure, frailty, and muscular weakness all contribute to the risk; deformed feet with ill-fitting shoes clearly render old people more vulnerable. Design of the home and its structural maintenance may be at fault, but are probably not of major importance; nevertheless, such features as loose, frayed rugs, highly polished floors, trailing electric cords, and narrow staircases with high treads all add to the risk. Many falls are unexplained but it is suggested that frailty, poor judgment, and haste are important contributory factors. There may be more than one cause—for example, the old person may be unable to lift his foot high enough, thus tripping over an invisible electric cord, all this associated with an attack of giddiness.

Further inquiry should be made into the maintenance of posture and its association with falling. It is difficult to see how many of these falls can be prevented, yet well-designed and well-maintained housing for old people should reduce the risk and maintenance of proper physical and mental function and of a good nutritional state should also contribute to safety. There is clearly need for more research in this important and tragic field, for, with the increasing number of old people in the population, it can be expected that the incidence of falls will also increase; in the meantime, much can be done to reassure old people and to explain to them how many falls can be prevented with reasonable care and attention.

accidents among older persons

BURNS AND SCALDS

For the number at risk, children under 14 have 5 to 10 times as many burn accidents as adults of working age; with advancing age, however, burn accidents again become prevalent and the risk in elderly people is 3 to 4 times as great as that in younger adults. In all age groups, women are involved much more than men. Although the majority of such accidents involve children, more than one-half of the deaths from burns and scalds occur in elderly people. Bull and Squire showed that, in children, a 50 per cent area burn carried a mortality of about 50 per cent, but that, with advancing age, the prognosis steadily deteriorated so that, at the age of 70, even a 10 per cent area burn resulted in a 50 per cent mortality.[5]

Old people are liable to domestic burns and scalds because of their frailty, failing vision, and inability to maintain posture easily or to recover from loss of balance. It is not uncommon to learn of an old person who had stumbled across the fender surrounding an open fire and fallen in the flames so that her clothes had caught fire. Since in England and Wales the open coal fire is the favored form of heating, it is recommended that fireguards should be used not only to shield children but to protect the disabled and elderly. Fireguards are required by law to be fixed to new electric heaters, gas heaters, and oil heating appliances but they are not legally required for open grates, and their widespread use must depend on public education and acceptance by the old people themselves.

The majority of scalds among old people happen, as in other age groups, in the kitchen; there are also incidents in which the old person is scalded as a result of feeling faint while in the bathroom, and collapsing in the bath full of hot water. Kitchen design and the use of safe appliances can reduce the hazard.

COAL GAS POISONING

In recent years there has been a progressive increase in the number of accidental deaths from coal gas poisoning. Not only has there been an increase in the total number of fatalities from this cause but also an increase per therm of gas sold. Age is an important factor, for three-quarters of the fatalities are in people over 60 and more than half are in people aged 70 or more. Three-fourths of these accidents are due to gas taps being turned on and left unignited; the cooker, oven, hotplate, or portable boiling ring is usually involved. It is difficult to explain this increase in gas poisoning accidents, but undoubtedly the greater proportion of old people in the population, particularly the expansion in the number of elderly persons living alone, is a factor.

It has been suggested that impairment or loss of the sense of smell may be one of the factors contributing to the prevalence of accidental gas poisoning among older persons. With this in mind, Chalke and Dewhurst analyzed the sense of smell of a representative sample of old people living in one part of London; they asked the old people to attempt to detect and identify certain common odors, including a sample of the town gas supply.[6] Results indicated that approximately 30 per cent of old persons could not reliably, and sometimes not at all, recognize the odor of town gas at concentrations below 50 parts per 10,000. These researchers believed that gas odor as a danger signal for accidental escapes of unburned gas was clearly unreliable for

TABLE 3

Average Death Rate from Falls Per Million Living 1952-1953

AGE AND SEX	SCOTLAND	NORTH OF ENGLAND	WALES, MIDLANDS, EAST OF ENGLAND	SOUTH OF ENGLAND
65-74 years				
Men	201	200	153	137
Women	247	230	212	159
75 and over				
Men	1,372	1,233	869	858
Women	2,854	2,131	1,655	1,439

old people living alone and suggested that further odorants be added to town gas to increase the threshold of recognition.

Considerable thought and research are being devoted to this important subject for it is appreciated that, although it is a statutory requirement that coal gas shall be recognizable by means of a distinctive smell, in old people the sense of smell diminishes and this danger signal in its present concentration may no longer be adequate. Gas stoves and other gas appliances are being designed, and spring safety taps are now being fitted, with the object of reducing the incidence of such accidents.

Accidents in Hospital

Greater attention is being given to reduction of accidents to patients while in the hospital. Snell showed, from a study of accidents in one hospital group of 1,450 beds, that accidents were much commoner among patients over 60 years of age and that nearly half of the patients who had accidents were being treated for cardiovascular disease.[7] Most of these hospital accidents were falls and 58 per cent took place at the bedside. Snell suggested that lack of supervision, high beds, and slippery floors were the main contributory factors.

Fine examined 250 consecutive accidents, mainly falls, which occurred during 1957 at Newsham General Hospital, Liverpool.[8] He found that the main clinical conditions associated with falls were confusional states and cerebral arteriosclerosis; he suggested that there was a relation between the number of nurses on duty and the number of falls among patients in the wards. These findings correspond closely with those of Parrish and Weil, who made an epidemiologic analysis of patient accidents at the Mount Sinai Hospital, New York City.[9] Their conclusions that "patients with defects of their neuromuscular and skeletal systems and those with advanced cancer and heart disease were found especially susceptible to accidents" corroborate the experience in this country.

Conclusions

There are many factors which will predispose old people toward accidents—the physiologic, psychologic, and pathologic

changes to be found with age and the environmental factors, which include homes which are badly designed or inadequately maintained. The prevention of accidents in the elderly is more difficult to plan. Living and working conditions suitable to their age and ability should help to reduce the incidence of accidents, but what is needed, fundamentally, is a far greater appreciation of the disabilities and limitations to be found in the aging process.

Drivers of vehicles, bus conductors, employers and overseers of labor, and others concerned with the problems met by old age can do much to miminize this daily toll of accidents, if they become aware of the physical and mental handicaps associated with senescence. It would be wrong to make old people so accident conscious that their existence becomes dominated by fear, but much could be done to make them aware of ordinary hazards which they face and to persuade them to eliminate some which need not exist.

The general practitioner and the medical officer of health can play an equally important part in this branch of preventive medicine. To some extent it is an unrewarding task, for progress is slow and old people do not welcome change or readily accept advice. Nevertheless, it is encouraging to remember that in England and Wales intensified efforts over the last decade to reduce the frequency of accidents in children are meeting with some success. With an aging population and with a continuing urbanization, it could be anticipated that accidents will increase in number and severity unless effective measures of publicity and education are taken. There is growing awareness of the problem, and it is this awareness which will help to reduce the unnecessary toll of accidents.

REFERENCES

1. Annual Report of Chief Inspector of Factories. H.M.S.O. Cmd. 9605, 1954.
2. KING, H. F., and D. SPEAKMAN: Age and industrial accident rates. Brit. J. Indust. Med. 10: 51, 1953.
3. WHITFIELD, J. W.: Individual differences in accident susceptibility among coal miners. Brit. J. Indust. Med. 11: 126, 1954.
4. SHELDON, J. H.: The Social Medicine of Old Age. Oxford University Press, for Nuffield Foundation.
5. BULL, J. P., and J. R. SQUIRE: Study of mortality in burns unit; standards for evaluation of alternative methods of treatment. Ann. Surg. 130: 160-173, 1949.
6. CHALKE, H. D., and J. R. DEWHURST: Accidental coal gas poisoning. Brit. M. J. 2: 915, 1957.
7. SNELL, W. E.: Accidents to patients in hospital. Lacet 2: 1202, 1956.
8. FINE, W.: Unpublished study.
9. PARRISH, H. M., and T. P. WEIL: Patient accidents occurring in hospitals: epidemiologic study of 614 accidents. New York J. Med. 58: 838-846, 1958.

A successful experience in collective living for an institutional family group of 127 men and women, based on individualization of care, is reported. A program of self-help can be developed in an institutional setting by which manifest and latent talents of residents are constructively applied at minimal cost.

Self-help in the management of the aged

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Self-help in the institutional care of the aged is an administrative advantage which is based on the individual needs and participation of each resident. Maintenance of activity for the aged, whether voluntary or induced, has preventive and curative possibilities in selected cases. The problem is how to produce this kind of activity painlessly, so to speak, with the full cooperation of the resident based on willingness as well as ability on his part.

Occupational therapy, as a profession, has always made self-help the keystone of its efforts and has used its strategic position to promote this contribution on the part of the resident. But even occupational therapists, with all their professional skill, have not always been successful along these lines, most often because some old persons resent being told what to do or think that they know better what is best for them. Some residents have anticipated, before admission, a Home in which they would be waited on, completely regardless of their own power to help themselves on occasion. When they accept self-help of their own accord, their cooperation is more effective, but, if told to do something, especially when their fur is rubbed the wrong way, they tend to hold back or do resentfully what they are told. We find something of this psychology in children, and it may be that this is one aspect of adult nature and character which survives and persists to the end.

One way to overcome such a negative attitude in the aged is to encourage them to be self-reliant as long as possible and to give them the feeling of continued useful activity despite their advancing years. Doubtless, there are homes for the

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aged which cannot afford the services of a trained professional therapist but would like to find an alternative way by which the residents under their care could help themselves. They know that a busy resident, busy especially in his own service, is a well-behaved resident, a more optimistic one, and a more useful one to his home as well as to himself. At The Evangelical Home for the Aged in Brooklyn, we have found at least a partial solution to this problem of keeping the residents busy.

Developing a Self-Help Program

The Home has a total resident population of 127, of whom 22 are over 90, 23 between 85 and 89, 47 between 80 and 84, 23 between 75 and 79, 11 between 70 and 74, and 1 is 69. Being faced with a restricted income which did not permit the employment of a professional therapist, the administrator arranged a meeting with the residents at which he put the problem frankly before them, calling for suggestions as the meeting proceeded. He explained the need for them to keep active and suggested that helpfulness in keeping house was one way of doing so effectively. The fact that we could not afford professional help was explained as a contingency which might occur even within the family which lives together at home. At this meeting, a self-help program was elaborated with the help of the group, and it is the purpose of this article to report the progress and success that were achieved.

RESIDENTS AID SOCIETY

A number of the residents had been members of such organizations as a Ladies Aid Society or a similar group for men in their respective churches during their younger, more vigorous years, and this undoubtedly had something to do with the type of plan which was developed. A Residents Aid Society was organized with the purpose of promoting self-help and mutual aid, utilizing whatever strength was left in the membership. The membership included all the residents of the Home, and each one pledged his full faith to the project. It was agreed to hold regular meetings on the afternoon of the first Wednesday of each month to receive progress reports and to formulate new plans. A president, vice-president, secretary, and treasurer were elected in good American style, although without competition.

RESIDENTS CHEER COMMITTEE

At the next meeting, discussion centered on ways and means of helping not only themselves but the other, more dependent members of the Home family. The discussion took on some of the aspects of group psychotherapy. A Residents Cheer Committee was appointed, the initial duty of which was to send get-well cards to residents who were sick and to those confined to hospitals and institutions away from the Home in order to maintain friendly contact under all conditions of placement. The committee's next endeavor was to plan a get-together, such as a card party, at least once a month, at which each participant made a small contribution if he chose to do so. These contributions covered the cost of get-well cards, and it was soon decided to send a dollar as a token gift to each sick resident on his birthday, Christmas, or Easter. These little gestures of thoughtfulness raised and sustained the morale of the entire infirmary department.

In one ward of the Home, there are 6 residents who, because of senility, are

unable to take proper care of themselves and require special attention. These patients attracted the notice of the committee, and a bingo party was arranged for their benefit periodically, at which other residents joined and played with each of the patients. It was arranged that each of the ward residents would win a modest prize, such as fruit or toilet articles.

ORGANIZING SALES AND SHARING PROFITS

For the past seven years, the Residents Aid Society has conducted two sales a year of a variety of articles made by the members. To promote these sales, advertising, decorating, sales, and refreshment committees are appointed, and it is heartwarming to see how successfully and efficiently they work together. The advertising committee invites the assistance of the local newspaper and puts up attractive notices in the local library. The decorating committee is responsible for the appearance of the booths and, after the sale is over, takes down the decorations. The sales committee does all of the pricing and selling of the articles. The refreshment committee arranges for the serving of beverages and cake. As much as $300 has been added to the treasury in one afternoon, with a total of $3,600 raised in this way since the inception of the sales.

Therapeutic benefit is derived not only from the raising of such funds but also from actually spending the money. All funds are controlled by the organized resident group, and a vote is taken after discussion to decide the purposes for which the money is to be spent. Thus far, the improvement of living conditions in the Home has been the heaviest charge on such funds. Material was purchased which the members have cut and sewed to make draw sheets for the infirmary as well as curtains, bedjackets, and hospital gowns for the sick. A special committee was appointed to select appropriate material, and volunteers were recruited to cut, sew, and make chair backs for the dining room. Beautification of the Home was as much desired by the residents as it was when they lived at home with their families.

The Society members bought a modern stretcher and furnished the doctor's office when they heard that the Home had engaged a part-time medical director to replace those physicians who were only on call. They also furnished a dining and sitting room, which was an innovation on the infirmary floor. They were always wanting to help those residents who could not help themselves. For example, they felt that purchasing these furnishings would be a means of giving those residents who, although ambulatory, were confined to the infirmary floor an opportunity to visit with one another and that it would also brighten their outlook. This is the goal we strive for when we try, with the help of occupational therapy, to get the aged to do things which will keep them active—and therefore alive. There is no trace of exploitation in such a program, but we are frank to admit that it cannot hope to replace the work of the trained occupational therapist. However, when the elderly do such things of their own volition and do it in a spirit of mutal aid, they are indeed fulfilling the modern requirements of self-help.

CHOIR

The residents also organized a Home choir under the auspices of the Residents Aid Society, and its director and organist is a resident of the Home. All expenditures for the music program are paid by the Society. The choir has since entertained groups which formerly came to the Home to entertain the residents!

NEWSPAPER

Another achievement has been the publication of a monthly paper, which runs to 7 and, sometimes, 8 pages. There is an editor, with a reporter on each floor, and an 83-year-old resident designs the cover. All the work of getting out this paper, exclusive of typing and mimeographing, is performed by the residents. They write the articles, assemble the copy, and distribute the paper.

CHOICE OF ENTERTAINMENT

All offers of entertainment from outside groups are passed on to the Residents Aid Society, which decides, independent of the judgment of the administration, whether or not to accept. The administrator feels that, when they decide for themselves after being informed of the offer in detail, they will get more good from it than if it were planned for them. This feeling of having an effective voice in the choice of programs makes for greater happiness and harmony in the group.

Discussion

We can instill this kind of spirit of self-help in our aged if we suggest to them how they can be useful to others. We encourage them to help themselves in a thousand different ways as they go about the business of living in a collective Home. We give them the feeling that they are needed not for what they have but for what they can still do, not only for themselves, but for others. Once this spirit is instilled, it is of great help in the geriatric program of self-help.

One of the first requisites of a self-help program is to relieve the stresses of everyday living. The aged too may be burdened by the kind of pressures which they themselves do not always recognize and understand. The struggle for existence somehow continues, even in a sheltered home for the aged. Everyone is subject to physical, mental, and spiritual vicissitudes in his lifetime, and some of these are more specific in the older age groups and require a special, individual kind of administrative response.

Some older people are upset by the sight of their graying hair as well as by their need for artificial dentures, hearing aids, glasses, and so forth. The condition of some older persons becomes complicated when physical changes bring on a decrease in strength, endurance, and speed and an increase in the time it takes to recover from overexertion or illness. It is sometimes hard for an aged person to convince himself that he is slower in planning and doing things than he was in youth. The motivation and the will are there, but the physical capacities are no match for them. Too often this precipitates fears and anxieties of varying degree.

Some older people will not accept such physical changes and react with a complete denial of them, insisting on their nonexistence by engaging in excessive activity, which results in overexertion. Others react by passively accepting, but grossly overemphasizing, physical changes and illnesses, using them in an effort to attract active sympathy. The mere statement of a premonition of a heart attack often brings attention from a neglectful family and brings a sharper focus on an elderly person.

Fortunately, the aged who are normal can adjust to the aging process under ordinary circumstances; it is here that self-help becomes such a valuable discipline. The older person must first realize that changes come with age and then ad-

just to them as required by the laws of nature. By doing all things in moderation, taking more time to do them, and realizing that there are many others who must face the same problems, he will make a comfortable adjustment. The elderly should be taught how to compensate for certain losses and for slowness in learning. They should be encouraged to spend extra time learning new things while making use of all the short cuts which they have acquired through life. Never force a situation where time can be used constructively for the benefit of an elderly person! Working with others on useful projects gives older people a feeling of being helpful and, what is most important, wanted.

EXPERIMENTAL EVIDENCE of marginal vitamin B_{12} deficiency is found in many aged patients. Old subjects retain more of an injected dose of vitamin B_{12} than do younger patients, probably because their tissues contain less of the vitamin. The serum levels of vitamin B_{12} regress with age, indicating that the reserves of the vitamin among the aged are more depleted. Achlorhydria and hypochlorhydria are common in older people, and both are associated with diminished absorption of orally administered vitamin B_{12}.

The glutathione content of red blood cells of old subjects is higher than that of younger individuals, and the ratio of oxidized to reduced dipyridinenucleotide in the liver of old rats is noticeably higher than that of adult rats. Both findings are usual in vitamin B_{12} deficiency. All these factors taken as a whole indicate a possible vitamin B_{12} deficiency among the aged.

B. F. CHOW: Vitamin B_{12} in relationship to aging. Gerontologia 2: 213-221, 1958.

POTASSIUM THERAPY may be useful in all but the least serious cases of congestive heart failure, except during renal failure with oliguria. Anoxia and other factors in myocardial insufficiency deplete potassium, and the loss may partly account for digitalis toxicity. Replacement of potassium often increases tolerance to digitalis and permits a larger dose. Even though potassium shortage in the majority of patients with congestive failure is not understood, the gratifying response in some cases is a strong argument for regular treatment.

A. R. LAVENDER: The relationship of potassium deficiency to congestive heart failure. Illinois M. J. 114: 281-282, 1958.

Rehabilitation of the Hemiplegic Patient

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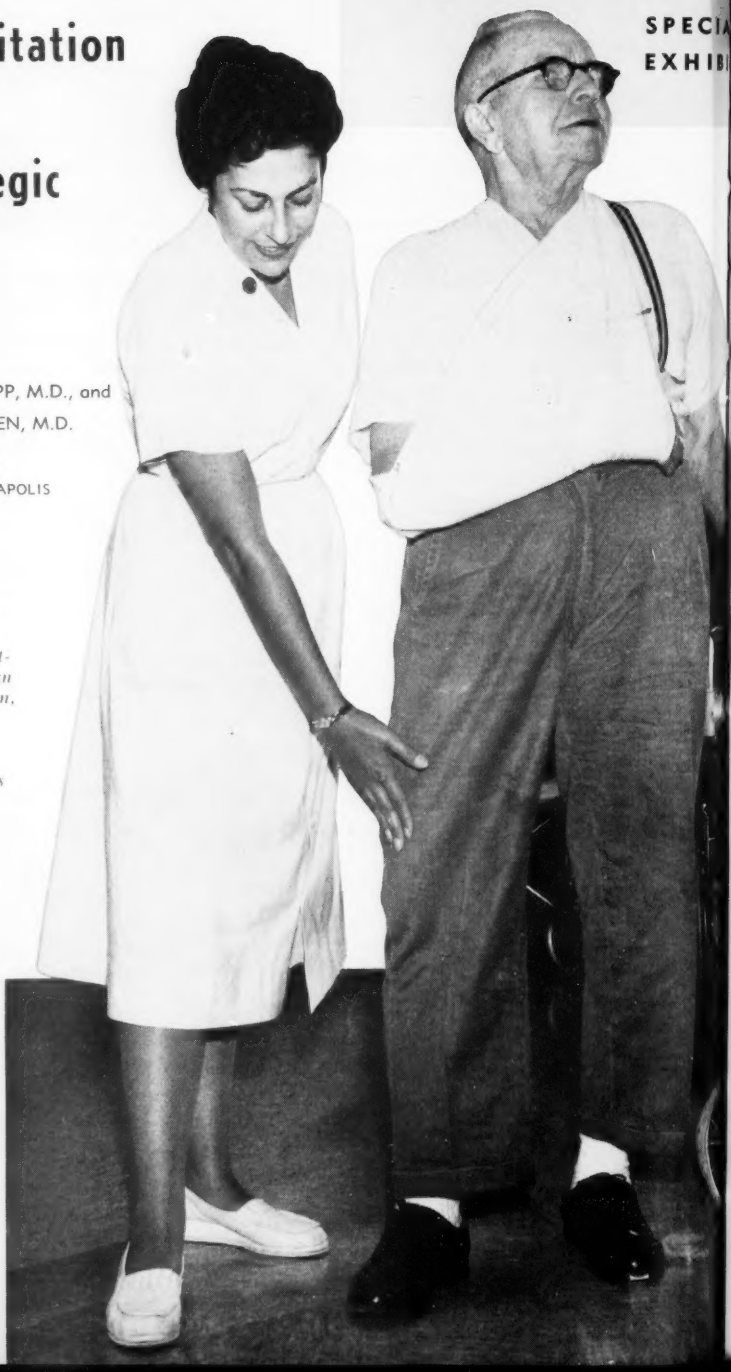
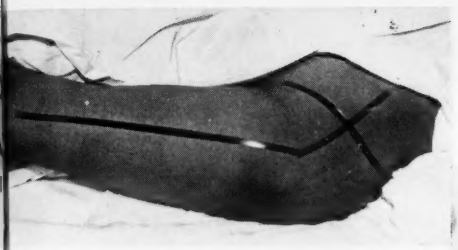
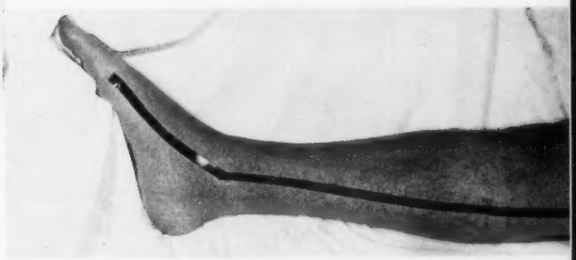
ELIZABETH KENNY
INSTITUTE, MINNEAPOLIS

Adapted from an exhibit presented at the annual meeting of the American Medical Association, San Francisco, June 23 to 27, 1958, and at the American Congress of Physical Medicine and Rehabilitation, Philadelphia, August 24 to 29, 1958.





Hip and knee flexion contractures.

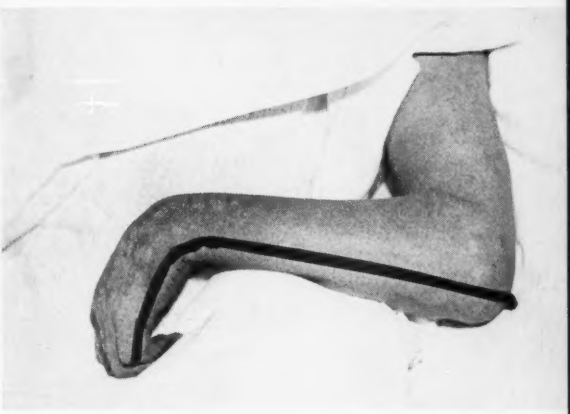


Plantar flexion contracture.

PREVENTIVE THERAPY

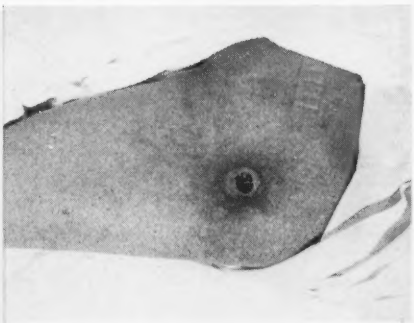
Good nursing care of the hemiplegic patient must be taught with eventual rehabilitation goals in mind. Dissemination of this information is one function of a rehabilitation center.

Good nursing care in the acute and early convalescent stages facilitates rehabilitation. Contractures frequently occur if the patient is poorly positioned and if range-of-motion exercises are not carried out.

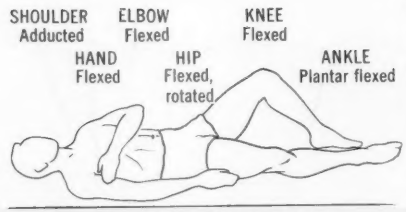


Flexion contracture at the wrist.

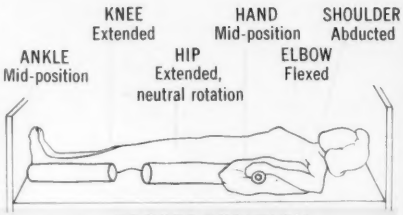
Skin breakdown frequently occurs if positioning is neglected and if the patient is not turned at regular intervals. Bladder and bowel incontinence increase the hazard.



Decubitus ulcer over trochanteric area.



TYPICAL POSITION



PROPER POSITION

BED POSITIONING

Proper positioning in the early stages makes possible proper bodily alignment which will hasten the rehabilitation of the patient. The typical hemiplegic posture encourages the development of contractures.

ERRORS IN POSITIONING RESULT FROM LACK OF PROPER INSTRUCTION

Pillows under head and trunk.

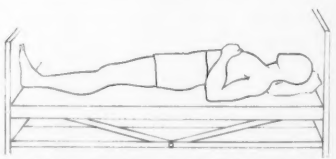
Pillows under knees.

Soft mattress.

POSITIONING AIDS ARE ADVISABLE TO OBTAIN PROPER ALIGNMENT

Abduction pillow and hand roll or splint.

Footboard.



Firm mattress and bed board.

Range-of-motion Exercises

- Range-of-motion exercises must be performed regularly to prevent contractures.
- Ideally, range-of-motion and muscle re-education should be carried out by trained therapists.
- Nurses, nursing-home personnel, or members of the family should be instructed in passive range-of-motion exercises when formal physical therapy is not available.
- These exercises can be carried out in conjunction with the routine bed bath.

Transfers

Early training of the patient in such self-care activities as transfers from bed to wheelchair, dressing and toileting will reduce the amount of nursing care and attention required by the hemiplegic patient. In some instances these activities will be the ultimate rehabilitation goal.

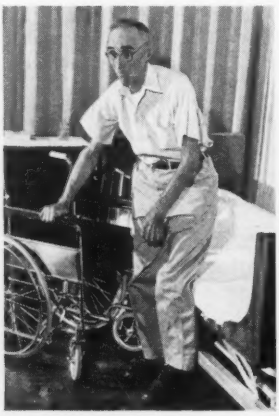
A method of transferring from the bed to a wheelchair utilizing a short side rail has been devised. Some patients with extensive brain damage may require supervision during transfers due to memory defects.

Good leg is placed under paralyzed leg to raise it from bed.

Patient comes to sitting position by using hand rail.

He checks to see if wheelchair is locked.

Hand is placed on far armrest of wheelchair.

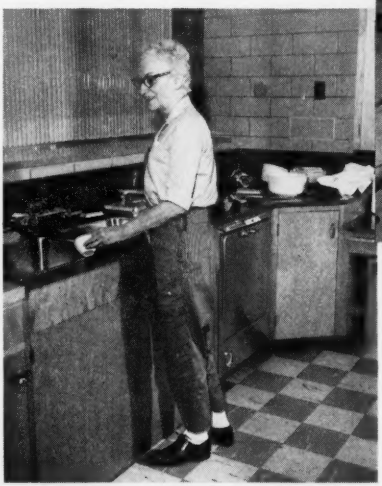


He stands.

He pivots on normal leg and sits.

Return to Active Living

Strengthening by progressive resistive exercises to the hamstring and quadriceps muscles enhances stability in walking.



This patient, who is recovering the use of her right arm and leg, washes dishes in the Institute's experimental kitchen. She walks with a cane. After additional speech therapy she will be ready for discharge.

He unlocks the wheelchair.

He lowers foot rest and places involved foot on it.

Using uninvolved hand and foot, he propels wheelchair.

Sociological implications of retirement

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Retirement has varied meanings, affected by social changes. As a life transition, it is influenced by roles, images, social categories, and dilemmas of policy, and, as a role transition, it implies a changed distribution of power. Planning with respect to the entire life cycle and further research are suggested.

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■ Retirement may begin in anticipation years before a name is stricken from a payroll and a gold watch presented. Retirement is not merely the transition from work to play, for there can be many anticipatory retirements in terms of both dread and pleasant yearning.

Although there is increased employment of women, retirement may not have the same meaning for them as for men. It may also involve a distinction between the rich and the poor and the healthy and the ailing. It is not easy to isolate retirement from the more general process of aging or to single out a more subtle retirement from an aspect of living, such as parenthood. There can be subjective retirement from life without change in labor force status. Retirement is difficult to define, and it is not easy to say when and how it takes place.

Perspective on Retirement

Retirement can be viewed as affected by social change. Urbanization, industrialization, and large-scale business enterprise give distinctively modern aspects to retirement experiences. Basically, retirement from work is now controlled by others rather than by the one who is retiring. Compulsory retirement is an aspect of bureaucratic social organization. It is interesting to note that statistics for 1957, showing that 53 per cent of the men between the ages of 65 and 69 were still in the labor force, are qualified by overrepresentation of older men in the diminishing agricultural pursuits.[1] The corresponding figure of 18.6 per cent for women may mean that they have not yet

been drawn into bureaucratic organization to the same degree as men.

A new dimension is also given to retirement by the extension of life expectancy at birth since 1900 by some twenty years to 69.6 in 1956. Other data for 1956 show that the life expectancy at birth of white women is 6.4 years beyond that of white men, which suggests greater frustration for women in both work and family life, and that white women now retire early from motherhood but have a life expectancy at 65 of fifteen and one-half years as compared with thirteen years for white men of the same age.[2]

Retirement can also be looked upon as one of the life transitions accompanied by varied rites throughout the world. It is not dissimilar to a puberty transition, a marriage accompanied by fertility rites, motherhood accompanied by isolation and purification, or death associated with ritualized mourning. Retirement resembles divorce both in view of variable circumstances and the absence of a fully developed ritual functionally appropriate to ease the strain of transition. Certainly, in all human societies there are changes of status of which retirement is only one.

Retirement can also be thought of in terms of roles and images; almost by definition it is a loss of role. Havighurst and Albrecht very usefully describe the older persons of Prairie City, a small community in the midwest, in terms of numbers and types of roles they must play.[3] A role implies a concept of one's place and an image of oneself in a matrix of activities and expectations. To the question, "Who are you?," a person must answer, "I am a retired such and such" and qualify his answer in terms of how he sees himself. As the sociologist Cooley showed long ago, a self-image is not to be dissociated from the social mirror held up by others. The retired person must come to terms with images which other people have of his retirement.

Again, retirement is related to the universal process of classification according to age and sex. Every culture provides containers for the amorphous potentialities of a particular age and sex. There may be rigid, dichotomous, coercive containers for the male and female or for the old and young. On the other hand, there may be flexible, permissive, cultural containers with provision for intermediate age-sex potentialities. Certainly some people in our culture are pushed prematurely into cultural containers with categorical expectations as to age and retirement. The category of "femininity" in our culture does not fit all women, and the category "over 65 and retired" does not fit all Americans. The proposition "over 65 and hence retired" illustrates a cultural container pressing painfully upon employees who are healthy, vigorous and creative.

Retirement as a Dilemma

A policy dilemma might be defined as a social situation in which there are two somewhat incompatible goals, each associated with a penalty or price, the price of one choice standing in contrast to the price of another.

One illustration might be a policy-dilemma involving optimism and realism. It is good to cheer the aged by tagging them with such pleasant labels as "senior citizen," assuring them of happy retirement years, exaggerating their work capacity, promising them worthy status, and minimizing biological senescence. However, adopting a more realistic attitude toward their health, income, social relations, housing, and personal adjustment makes for more effective personal planning. The price of unrealistic optimism is frustration, disillusionment, and

neglect. A retired person living on an old age pension of 50 dollars a month may feel that he is being treated like a child, beguiled by myths and fairy tales. He could say, "Senior Citizen, O.K., but don't forget that my arthritis hurts." On the other hand, the price of a realistic approach may be a dread of aging and a puncturing of wishful fantasies which, for a given individual, may actually ease the transition into the category of "aged and retired." Aldous Huxley in his "Brave New World" contributes to the thought that realism means denial of the soothing benefits of myth and Miltown.

Another abstract policy-dilemma involves social integration as compared with social segregation. To illustrate, the aged and retired can be regarded as just people grown older or as a large minority group differing biologically from others because of their aged bodies. There is virtue in a policy which makes an aged person feel part of the family, the work force, and the community. The price, however, for such a policy is continued straining and striving, frustration of incomplete acceptance, and ignoring of special needs. On the other hand, the segregation of the aged in special classes, in special clubs, in special housing arrangements, in special jobs, in special forms of leisure activity, and in roles defined by age means that a contrasting price might be paid by some. This price may involve inferiority feelings, a sense of isolation, or the painful breaking of old habits.

A third somewhat more specific illustration of a dilemma is a "flexible" versus a "rigid" retirement policy. A flexible policy recognizes individual differences and thus yields many benefits to society and to the still youthful older person. The price involves lack of preparation in view of the hope that retirement may be deferred or gradual, with an additional component being invidious comparison and suspicion of injustice. Perhaps one characteristic of senility is obtuseness as to the appropriateness of retirement. The other horn of the dilemma involves a price which is better recognized. A rigid, inexorable, sudden retirement at 65 means loss of work achievement to youthful individuals and to society and, furthermore, fosters a sense of injustice all the more acute because of realistic self-estimates of continued competence.

A dilemma framework guards against wishful thinking and prompts a rational comparison of contrasting types of benefit and price. It stimulates a search for a middle ground between the horns of a dilemma but with recognition that a middle choice generally means that some compromise price must be paid.

Role Changes With Age

Retirement may also be considered as a time of role transition or role change, such as takes place in adolescence, upon entrance into the labor force, and in the transition period from single to married status, childless to parent of first born offspring, well to sick, sick to well, married to divorced, married to widowed, and civilian to soldier.

Generalizations derived from such role transitions could help in understanding the transition from employed to retired status. Probably in every case there is anticipation of this transition by both self and others. Emotional ambivalence is also characteristic of role transition, as illustrated, for example, by the marriage license which is not used,

the mixed feelings of parents about launching children into adult life, and a generalized and selective nostalgia for the pleasant aspects of a prior role.

One aspect of adjustment to role transition is judicious assessment of a new pattern of obligations and privileges. Some newly retired persons may seek a double quota of privilege, privileges of the prior role plus those of the new role. To illustrate, a newly retired businessman may still want to boss the business and yet enjoy the leisure of retirement. Some people may want to work as hard as ever at making a living and yet feel duty bound to make the most of retirement by devoting part of their time to providing new services for others.

There is also a timing aspect to the changing role in view of the fact that social roles are transmissible, with other persons taking an abandoned role. Although one person may be pushed prematurely by others into a retirement role or may push himself into that role with undue haste, others may delay and resist an appropriate role transition. For example, overly dependent adult offspring or incompetent subordinates may delay retirement, or a person may himself frantically resist his retirement beyond his own good and the good of others.

Life Cycle and Retirement

The life cycle concept provides still another approach to aging and retirement. One implication of this viewpoint is awareness that the population moves through the stages of educational preparation, work and reproduction, and, then, retirement. Questions can be raised concerning the distribution of social burdens carried by the young, middle-aged, and the aged. Does education, because of the time needed for its acquisition, preclude contributions to the total national income especially in view of the need for early work experience for later work experience? Does the labor force carry too great a burden in supporting both the old and the young? Could a fairer distribution of burdens throughout the life cycle be achieved by new forms of insurance, pensions, wage structure, taxation, and social security provisions of the federal government? More equitable distribution of burdens throughout the life cycle would provide more balanced experience in work and reproduction, effort and leisure, and achievement and enjoyment.

The cycle of family life might also be altered to provide a happier answer to the question of what happens after retirement. In our culture, the family consisting of parents and children only is now favored over the extended family which includes other relatives, such as grandparents or aunts and uncles. This new family group tends to be child-centered in that children are given no clear role to play with respect to retired parents. With greater educational and cultural homogeneity, adult offspring might render more service to retired parents and retired parents to adult offspring. Perhaps grandparents need not be so undervalued as baby sitters or as assistants when mothers return to employment after their children are in school.

From a financial point of view, adequate earnings prior to retirement could subsidize offspring who are young parents in exchange for help with annuities when the burden of child rearing is past in the younger generation. For example, 50-year-old fathers could help 25-year-old sons and be helped at 70 by 45-year-old sons now at their peak of earnings, with offspring well launched. There is no implication that trends in family life will be abruptly reversed, but, before consigning protection of the aged to the

state, the ancient tradition of mutual aid throughout the different stages of family life might be re-examined.

Changed Distribution of Power

Distribution of power changes throughout life and, in general, retirement brings with it a relative decrease of power in its various aspects. The power struggle is reflected in such terms as "Old Hag," "Old Meanie," and "Old Grouch," which are occasionally countered by such epithets as "Young Pup" or "Smarty Pants."

In their recent book, "The Academic Marketplace," Caplow and McGee note that resignation of an academic position brings little departmental regret and is rarely associated with a ritual of farewell.[4] Retirement means increased power to successors, and anticipated retirement probably means a loss of power prior to retirement. A subordinate can murmur: "I can talk back to him now for he won't be around to vote against me." As reported by Caplow, the professors who resigned on very short notice probably saved themselves the strain of an anticipatory power shift.

Research Areas

Further study of retirement in relation to the family pattern seems highly desirable. There is some evidence that family life has great influence on job satisfaction before retirement. If William Whyte's account of "The Organization Man" be accepted, there is a growing integration of job and family.[5] Certainly work needs to be done on a comparative study of the retirement-adjustment pattern of married, widowed, and never-married persons. In a study of unknown authorship in which retired married university professors were sampled, a marked relationship was found between the creativity of these professors after retirement and the educational characteristics of their wives.

In regard to parent-child patterns, early studies showed that aged persons often have rather unhappy relations with their grown offspring.[6] Such interview studies of different generations need to be repeated with varying and recent samples. It would be fruitful to explore the possibility that the vestigial sense of duty toward their retired parents would be felt differently by adult offspring, depending upon sex, birth order, and experience in childhood. Perhaps there is a relatively impotent sense of duty felt by daughters as compared with sons. This sense of duty is often closely related to whether an aged adult is taken care of at home under doctor's orders or sent to a medical care facility, such as a nursing home.

It may also be noted that, with the increased employment of married women, the traditional picture of retirement by a male family head is no longer realistic. Although women are far less likely than men to be in the labor force after the age of 65, in the future the more durable and younger employed wife may often retire after her husband. His earlier retirement might bring special frustration with a loss of male dominance based upon a traditional role as breadwinner. Changing husband-wife relationships give new facets to the retirement problem.

In addition, we need to know more about the impact of retirement upon personality. Drastic reorientation upon retirement may occur more often in fantasy than in reality. Degrees of freedom are reduced by age, but general

orientations may remain rather constant throughout life. Future research may show that a prior orientation remains distinctive after retirement, a plausible hypothesis being that people after retirement remain what they were before, only less so because of diminished life energy. Perhaps William Whyte will write a book entitled "The Organization Man Grows Older." It may also be true that persons who are retiring seek especially to continue satisfying experiences of the past and to avoid or to compensate for unpleasant experiences. For example, cherished scientific creativity may be continued without a laboratory, or the work monotony experienced in the past may be replaced by an overzealous drive for adventure.

It would also be interesting to probe further the possibility that certain people have a built-in toughness and adaptability which endures throughout their lives. Longitudinal studies of identical and fraternal twins could be made with reference to retirement. Identical twins might show a differential similarity in adjustment which extends to the retirement period.

It is also possible that retired persons could accept and understand the needs of younger persons better than the reverse. It may be that, throughout the stages of family life, a mature and experienced person can show more understanding of a younger person now playing a role which the older person once had. The retired grandfather has been an adolescent, but the adolescent has never been a retired grandfather. It is doubtful that the sympathy and insight of children would support an extensive program seeking to establish older people as "Foster Grandparents," although there might be some modest success in this type of undertaking.

Retirement Aspirations

The retirement period is characterized by deprivation of youth, meaningful friends, and relatives and, in general, by fewer and lower aspirations, with less conflict and frustration. The study made of older people in Prairie City showed that about 40 per cent seemed happy and only 18 per cent seemed unhappy and that good health, fair income, social activity, and success in handling stress situations of the past were associated with happiness and adjustment after retirement.[7]

A very simple aspiration after retirement, when there is less danger of disapproval, is to live by principle rather than expediency, in moral freedom rather than in bondage to the opinion of others. Since future generations have become more meaningful to them because they have lost many friends and relatives, retired persons could provide invaluable moral leadership. It is granted that after retirement people may just watch television and be concerned about a good meal, but some find, in their freedom from work, time to care about the future of mankind.

REFERENCES

1. Older people at work. Statist. Bull. Metrop. Life Insur. Co. 39: 6-8, 1958 (June).
2. Longevity changes little in recent years. Statist. Bull. Metrop. Life Insur. Co. 39: 1-3, 1958 (June).
3. HAVIGHURST, R. J., and R. ALBRECHT: Older People. New York: Longmans, Green & Co., Inc., 1953, pp. 266-284.
4. CAPLOW, T., and R. J. MC GEE: The Academic Market Place. New York: Basic Books, Inc., 1958.
5. WHYTE, W. H.: The Organization Man. Garden City, New York: Doubleday & Company, Inc., 1957.
6. DINKLE, R. M.: Parent-child conflict in Minnesota families. Am. Sociologic. Rev. 8: 412-419, 1943. Attitudes of children toward supporting aged parents. Am. Sociologic. Rev. 9: 370-379, 1944.
7. HAVIGHURST, R. J., and R. ALBRECHT: Op. cit.

The process of aging is a combination of biologic and physchologic changes, varying in nature and intensity with the individual. Such factors as biochemical processes, decreased sexual function, increased incidence and severity of disease, and adjustment to physical and environmental changes are discussed.

General physiology of aging

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Aging is a complex of phenomena, partly exogenous, partly endogenous, in which physiologic and pathologic processes are often inextricably mixed and which affect the various cells and tissues of the organism in a variable degree. As our knowledge of the mechanisms underlying the processes of aging is still insufficient, it is at present impossible to define these processes in other than descriptive terms, and as such the following description is offered.

The Characteristics of Aging

Aging has at least the following components:

- Progressive biologic processes, probably of a biochemical and biophysical nature, localized in the protoplasm and the intercellular substances, which are morphologically manifested in the common signs of aging, such as graying of hair; loss of elasticity of skin, blood vessels, and lungs; atrophy and pigmentation of various organs; and diminution in function of sense organs. As yet, little is known about the nature of these processes, and it is even questionable whether they have, in fact, one common cause.
- A functional and structural decline of the reproductive system, which affects both the external and internal secretion of the gonads. As a result of the former, reproduction becomes impossible, and the latter has important consequences for the structure and function of the remainder of the aging organism. The cause of this "physiologic hypogonadism" during old age has not yet been elucidated completely. What has been established, however, is that many changes, both somatic and psychic, which were previously regarded as inherent to

biologic aging, are in reality sequelae of a deficiency of the sex hormones, as they can be partly or completely reversed by adequate hormonal substitution.

- An increase in frequency and intensity of so-called diseases of old age, although most of these diseases may occur at an earlier age. The most important of these are certain diseases of the central nervous, vascular, and locomotor systems; diabetes; and the neoplastic diseases.

- A cumulation of the sequelae of certain lesions, often chronic, which do not give rise to obvious disturbances until after several years and which, therefore, cannot become clinically manifest until advanced age. These diseases include the progressive sequelae of intoxications, such as smoking and drinking, and the lesions caused by excessive or abnormal mechanical strain (arthrosis deformans), by undernutrition (protein and calcium deficiency), and by malnutrition and overeating (atheroma and diabetes).

- A decreased capacity of adaptation to changes, particularly to unfavorable changes in the external environment; less ability to resist, adapt to, or compensate for such stress situations; and, consequently, greater inability to live without assistance and protection, which in western society means an increasing dependence on others.

- Objective and subjective changes of psychologic nature (of which the latter are known only in man). These changes, partly correlated with and resulting from the individual's infantile and adult personality, cause him to adopt a different life attitude during old age. The essential features of this aspect of aging can be described from a neuroanatomic, neurophysiologic, behaviorpsychologic, or phenomenologic point of view. Objective methods have been used, for instance, to study the neuropsychiatric and clinicopsychologic changes in sensitivity, intelligence, affectivity, and psychomotor behavior in the aged. These investigations have not yet led to a uniform formulation of the psychologic aspect of aging. Particularly, it remains difficult to distinguish between the "normal," often beneficial processes of psychologic aging and their pathologic exaggerations. The social consequences of this psychologic aging are considerable.

- As a result of the combination of the above processes, aging is characterized by a progressively increasing mortality.

Besides the processes of aging or *senescence*, we distinguish *old age* or the *senium*, which is characterized by a more or less stable condition of equilibrium in which the above-mentioned progressive processes have reached a certain degree of steadiness, so that a new homeostasis has been established. It is questionable whether it will ever be possible to give a more precise definition of the "senium."

In this report we shall confine ourselves further to the general biologic aspects of aging and shall not discuss the disease processes accompanying old age, although it is evident that the distinction between biologic and pathologic aging is often arbitrary.

General Physiology of Biologic Aging

It is apparent that any investigation of the biologic process of aging as it takes place in the protoplasm and the intercellular substances must offer considerable difficulties. Both macroscopic and microscopic inspection and biochemical examination of cells and tissue of older animals reveal that not only do different individuals differ in their signs of aging but that the phenomena of senescence are unequally distributed over the tissues of the same individual at a certain

chronologic age. This has been confirmed by clinical investigations and by pathologic anatomic findings in extremely old subjects. No animal or man dies from a "total" death of his entire protoplasm. The individual's life is limited by the fact that one or more of his organs fail in their adaptation to an exogenous noxa, as a result of which the entire machinery of the organism ceases to function as a whole. Invariably, however, even at the time of death of very old multicellular organisms, there are still cells, organs, or organ-systems which, insofar as can be ascertained, possess sufficient vitality to have continued to live for some considerable time. *It appears that senescence takes place with unequal intensity, or at least at a different rate, in all cells or tissues.*

CELLULAR GROWTH AND MULTIPLICATION

Various gerontologists have pointed out that the senescent processes occur earliest and are most marked in those tissues and cells which show least growth in the sense of cell multiplication, and which have, therefore, been referred to by Buerger as *bradytrophic*: the lens, cartilage, arterial walls, and central nervous system. Fewer and later signs of senescence occur in tissues in which cell division is continuously taking place, or the so-called *tachytrophic* tissues: epithelium, fibroblasts, hemopoietic organs, and liver.

Certain cell types have even been demonstrated in a most impressive way to be apparently immortal as long as they are multiplying. This was shown by Carrel's classical experiments in which a thirty-six-year life span was maintained for fibroblasts originally obtained from a chick embryo heart and preserved in tissue culture. The period of thirty-six years is many times longer than the expected life span of these cells had the animal heart been allowed a normal evolution and completion of a "physiologic" life span. At the termination of the experiment, the cells still showed the same rate of growth and, insofar as could be ascertained, the same "juvenile" vitality and health as when the culture was started.

A similar potential immortality is observed in bacterial cultures which, when multiplying under suitable conditions, also seem to maintain an unlimited vitality. Biologically speaking, therefore, senescence does not seem to affect all forms of protoplasm per se.

The question arises, however, as to whether this is the same problem as that encountered with the use of the terms senescence and death in connection with *individuals*. These fibroblasts or bacteria, which multiply by division before they die as individual entities, merely prove that the protoplasm, at least in certain organized structures, can be *potentially* immortal. However, these experiments on colonies or communities offer no strict analogy to the senescence of the multicellular organism or of the individual cell. If we want to study the biologic processes of senescence in tissues or isolated cells, other test objects than these proliferating colonies should be found or we should discover ways to study those individual cells or bacteria in colonies that do not divide but age and die individually. Let us therefore consider the other methods that have been used for the study of the problem.

COMPARISON OF TISSUE COMPOSITION

One of the methods most frequently used for this purpose is the comparative

examination of the microscopic and chemical composition of tissues or of the metabolic processes in young and old animals or human subjects.

An attempt to summarize the findings obtained by these comparative histologic and biochemical investigations confronts us with literature which is far from clear. Many observations quoted have not been confirmed by subsequent investigators; observations made in some animal species or in some tissues from the same animal species are not always applicable to other tissues or species. Investigators in human gerontology have sometimes neglected to distinguish between results obtained in healthy and ailing aged subjects or to mention whether the subjects they investigated were suffering from overnutrition or malnutrition. Some investigators have based their conclusions on data obtained on extremely old subjects (that is, over 80 years of age); other investigators compare "elderly" subjects, aged 45 to 65, with younger individuals. It may be that such groups of middle-aged subjects show signs of senescence which are completely different from those seen in subjects who have reached the comparative stability of the senium. It is particularly regrettable that many investigators have used chronologic age as the sole criterion in the selection of their test subjects. As a result, some investigators may have observed or missed certain senescent processes which others described in persons of the same chronologic age. The following discussion is, therefore, merely an impression from the often controversial data collected in the literature, most of which still require verification.

VARIATIONS IN WEIGHT

Many investigations have revealed an increase in water content with advancing age, especially in certain tissues of the multicellular animals; whether this is a sequela of a decrease in the quantity of active tissue remains to be established. The majority of investigators, moreover, have found an increased fat content of the organism in senescent man and most mammals as compared with younger individuals whose systems are relatively rich in protein. Strictly speaking, it is not certain whether this difference is caused by the biologic senescence of the tissues. It may also be a result of factors such as hormonal deficiencies or reduced physical activity combined with constant or even increased food intake, as is the case in many older individuals. This decreased protein content is morphologically correlated with a decrease in muscle volume and muscle weight, affecting both the smooth and the striated musculature, and a decrease in weight and volume of the parenchymal organs, such as the liver and kidneys. The correlation has been found only on statistical comparison, however; the so-called senile atrophy is not found in all chronologically old individuals per se. Every clinical investigator is familiar with the fact that some aged individuals show an absolute excess of fat, whereas other old subjects tend to thinness or even cachexia. Thus, although both have a diminished content of lean tissue, the fat excess in some is absolute and in others only relative.

CALCIUM AND PROTEIN CONTENT

Various investigators, including Lansing, have demonstrated an increase in the calcium content of certain tissues, particularly the brain and elastin fraction of the arterial wall, with increasing age. This is often associated with a decrease in skeletal calcium content; it is difficult to decide whether a physiologic or pathologic phenomenon is involved.

Investigations have also been made into the nucleoprotein content of cer-

tain cells of older individuals as compared with the values found in younger subjects. The results obtained do not yet indicate a general change with increasing age. The elastin in older subjects was found by Lansing to have a higher asparaginic and glutamic acid level, and the question of whether the cell protein composition changes with age has repeatedly been posed by Korenchewsky and his school. Various histologists have noted that, in certain tissues from older mammals, the cell nuclei are relatively larger and apparently richer in chromatin than those of younger individuals. This has been correlated with changes in the ratio of desoxyribonucleic to ribonucleic acid—substances which occur predominantly in the nuclei and protoplasm, respectively, where they play an important role in the regeneration of intracellular protein. Attempts have also been made by various investigators to demonstrate a decrease in the permeability of older cells as compared with younger. Rudzinska is reported to have suggested that senescence is characterized by cellular dehydration, as a result of which the protoplasm shows a transition from the sol to the gel state, but this generalization has hardly been substantiated by experimental evidence.

PIGMENTATION

Histologists and pathologists are familiar with the senile pigments present in the cells of certain organs of old individuals. Exhaustive investigations have been made particularly into the nature of the brown pigment in the liver and myocardium in old age and the yellow pigment found in the ganglion cells in various animal species, including man. These pigments probably originate from the mitochondria. Their presence is often, but not always, associated with senile atrophy of the organs. It has not been established with certainty, however, whether the presence of these pigments constitutes the chemical basis of cellular senescence or whether they are deposited in the cells *as a result* of a more fundamental change in the metabolism of the aging cell.

The same holds true, to some extent, for the graying of hair at a mature age. Biochemical investigations have hitherto failed to explain the cause of the disappearance of pigment from the cortex of the hair, from which graying results.

METABOLISM

Many investigators have reported a decrease in oxygen uptake per square meter of body surface in the senium. This is a predominant finding in emaciated, typically "senile atrophic" subjects, the majority of whom, as a rule, consume few calories or have low protein diets combined with reduced physical activity. This so-called *senile involution* of some aged subjects is not limited to the adipose and muscular tissue but also affects the cerebrum, myocardium, kidneys, and liver. The decreased oxygen uptake of old age appears to be a manifestation of a decrease in active metabolizing tissue associated with this form of atrophy.

Most investigators have found that both the basal and total metabolism are decreased in subjects of this category. This is certainly not true for every chronologically old individual, but it does seem as though this decrease in total and basal metabolism is typical of the process of senile involution, to which each aging individual, if left enough time, would eventually succumb. If this concept were confirmed, the decrease in oxygen consumption could be regarded as a constant manifestation of true biologic se-

nescence, of which senile atrophy would be the morphologic expression.

Three factors seem to take part in the origin of this metabolic decrease:

• Senile hypogonadism. This condition is caused by a deficiency of the internal secretion of the gonads. The androgenic hormones in particular are known to exert a positive anabolic effect. The decrease in the quantity of circulating estrogens in the female and of androgens in both males and females, as indicated by the decreasing 17-ketosteroid excretion with increasing age, must be regarded as a factor contributing to the atrophy of muscles and parenchymatous organs and to the decrease in their metabolism.

• Senile anorexia. A decreased appetite is observed, not only in the human senium but also in aged animals. This senile anorexia may be a result of the deficiency of the appetizing effect of the sex hormones on the central nervous system but seems more likely to be a direct result of a diminished diencephalic activity. Maier's investigations have indicated that appetite is determined by a glucostatic mechanism, the center of which is localized in the brain stem. A diminished activity of this glucostatic mechanism must exert an influence on appetite. Thus, the so-called spontaneous or natural anorexia of old age may be regarded as a partly hormogenic, partly neurogenic, diminution of appetite. Because of this lessened appetite, the decreased metabolism in certain aged subjects is analogous, at least in part, to the decrease in metabolism in other cases of chronic undernutrition, where it is likewise associated with muscular, hepatic, and renal atrophy. *Senile involution can therefore be regarded, at least partly, as a sequela of undernutrition.*

• Decreased production of growth hormone. The third factor to be mentioned as contributing to senile atrophy is the possibility—purely hypothetical for the time being—of a decreased production of somatotropin or growth hormone by the anterior pituitary during advanced age.

Various investigators have described a decrease in pituitary weight and changes in the pituitary histology in senile subjects. The eosinophil cells, in particular, show a decrease in these cases, while it is also in these cells that anomalous pigment granules accumulate. Now it is almost certain that the growth hormone is produced by the eosinophil cells. The secretion of growth hormone increases protein anabolism, to which the growing organism reacts secondarily by an increased production of insulin, thus profiting from the anabolic protein effect for its growth and simultaneously maintaining or increasing its carbohydrate metabolism.

A deficiency of growth hormone during the senium would result in a reverse effect on protein metabolism. A diminished protein anabolism would give rise to only minor manifestations in body size once the subject has reached certain dimensions. Yet the geriatrist is often struck by the fact that senile atrophic individuals also seem to diminish in height, possibly because of vertebral atrophy, and that the hands and facial features, especially brows, zygomatic arches,

nose, jaws, lips, and ears, become smaller and assume a more delicate and frail shape. A similar condition is also found in cases of pituitary cachexia. However this may be, it is at present merely a hypothesis that a deficiency of growth hormone—associated with diminished production of sex hormones and the loss of appetite—contributes to the decreased protein anabolism and total tissue metabolism which is associated with senile atrophy or involution. Whether a diminished production of thyroid-stimulating hormone, the thyreotropic principle of the pituitary, works in the same direction has not been established.

Nutrition, Metabolism, and Duration of Life

The significance of a decrease in food intake and metabolism for the process of aging and the individual's life span has been studied both in unicellular and multicellular animals. There are unicellular organisms, for instance, which cannot multiply by division ad infinitum, and which, therefore, are suitable objects for a study of aging. Rudzinska experimented with a protozoon (Tokophyra infusionum) which does not propagate by division but by budding, whereby small daughter cells arise from the mother cell while the latter remains intact. If, in a culture of these protozoa, the quantity of nutrients is increased above a certain limit, the cells begin to store large quantities of material; they reach an unusual size but after some time are no longer capable of reproduction and die earlier than is normal for the species. However, the life span of these protozoa can be prolonged by undernutrition.

McCance and Hamilton studied the same phenomenon in another protozoon (Tetrahymena). In a nutrient medium with a high carbohydrate and a low protein content, insufficient for mitosis, the individuals enlarged to the size of giant cells, full of fat; the life span of these giant cells, however, was shorter than normal. The same was observed when, to arrest mitosis, nitrogen mustard was added to a nutrient medium of normal composition; large, nondividing cells developed, which died prematurely.

These experiments therefore seem to warrant the conclusion that overfeeding of the individual cell abbreviates the life span, while a certain degree of undernutrition prolongs it.

Similar observations have been made in silkworms and drosophilae. Undernutrition of these insects during the larval period results in prolongation of this period and of the entire life span of the drosophilae from an average of nineteen to, in some cases, as many as twenty-nine days. A prolongation of the life span of the trout due to undernutrition was first described by McCay and associates as early as 1929. This investigator has since carried out similar experiments, chiefly in rats, which have become classics. McCay's investigations have been repeated in the form of intermittent fasting by Carlson and Hoelzel in the United States and in the Netherlands by Jansen and Wostmann; they have been uniformly confirmed and have acquired worldwide recognition. It has now been convincingly demonstrated that rats given a well-balanced, low calorie diet grow slowly, if at all, but live considerably longer than do control rats given an unlimited normal or optimal diet. Several organs of these animals are histologically much younger than is compatible with their chronologic age. Rats thus submit-

ted to undernutrition and retarded growth were returned to a quantitatively unlimited diet after seven hundred days in one experiment and after nine hundred days in another. Subsequently, growth occurred at an age at which nearly all the control rats had already died! In a subsequent experiment, growth potencies were still demonstrable on the thousandth day of life in animals which had been kept on a subcaloric diet.

Apart from the possible significance of these investigations for the correlation between nutrition and life span in other animals, these results are highly important because they are compatible with clinical observations in man, which seem to show that the majority of individuals reaching a very old age have a low, rather than an average, and certainly not a high body weight. As confirmatory evidence, the statistics of the American life insurance companies have uniformly shown that obesity leads to abbreviation of the life span; this is in agreement with what has just been described with reference to unicellular organisms. The same holds true for overfed mice and for rats in which, by puncture of the hypothalamus, the mechanism regulating food uptake was destroyed, so that they overfed themselves until obesity developed. The life span of such animals was shorter than that of the normal controls. An interesting feature is that the prolongation of life in McCay's underfed rats did not result from the prevention of such metabolic disorders as lead to a fatal issue in overnourished human individuals—diabetes, cholelithiasis, atherosclerotic heart disease—but from a delayed appearance of respiratory diseases, which are the most common causes of death in aged rats.

TEMPERATURE CONTROL

Another experimental method of retarding senescence or, at least, of prolonging life, is freezing to temperatures at which life processes, insofar as can be established, are virtually arrested. For this purpose, Parkes and co-workers elaborated a technic by which cells and tissues can be frozen to the temperature of carbon dioxide snow (–79° C.) or liquid air (–190° C.). Erythrocytes and spermatozoa stored in this frozen condition were found after thawing to be still alive at a time at which control cells or tissues kept at body temperatures were either long dead or showed advanced aging. Erythrocytes stored under these conditions for two years were used for transfusion; in the recipient, they had the same life span as fresh blood cells. Bull spermatozoa kept in this way for one to two years were successfully used to inseminate cows, which subsequently produced normal calves.

The technical difficulties in these experiments have precluded, so far, the freezing and storage of intact animals by this method. Isolated rat ovaries and guinea pig uteri, however, have been stored in this manner for as long as a year. Implantation of such an ovary into a castrated animal resulted in the development of follicles with ova in the implanted ovary and estrous changes in the vagina. The ovarian implant was extirpated after some cycles and, on microscopic examination, showed a completely normal, mature structure. The uterus stored in a frozen state manifested normal rhythmic contractions after thawing.

APPLICATION

It is, of course, not certain whether this prolongation of the life span of cells, organs, or whole animals by freezing or undernutrition can, in fact, be called a retardation of the biologic process of senescence, although it is interesting to

note that coldblooded vertebrates, in which the level of metabolism is low, generally have a longer life span than warmblooded species of the same size. The essential fact, however, is that certain phenomena of aging, which ultimately result in death, do not appear or occur later in cells or individuals in which metabolism is slowed by undernutrition (unicellular organisms, insects, rats), by cooling (erythrocytes, spermatozoa, ovaries, uteri), or, in the case of seeds, by drying.

In view of this fact, it seems reasonable to doubt that senile atrophy or involution is to be regarded as an unfavorable regressive phenomenon. Rather, this process seems to constitute an interesting, biologically useful phenomenon of adaptation. The cessation of the endocrine functions of the gonads and the pituitary and the neurogenic diminution of appetite are, so to speak, a natural application of the undernutrition experiments of McCay, which may retard further aging and thus contribute to a prolongation of the life span of the individual.

At least one important restriction, however, should be made in this respect. Prolongation of life as a result of underfeeding, as observed by McCay and others, occurred only in experimental animals which lived under the exceptional, protective conditions of the laboratory. McCay himself found that underfed dogs have a shorter life span, which he believes to be due to a diminution of the dog's resistance to intestinal and other parasites by the underfeeding. It is extremely doubtful that underfed rats would live longer than the normally fed animals if the experimental colony were continually exposed to such normal stresses as changes in temperature or infections.

During the German occupation of the Netherlands, it was in the underfed, aged individuals that tuberculosis spread most rapidly. Physicians who have witnessed large epidemics of pneumonia, typhoid fever, and malaria agree that the chances of life under such conditions are most unfavorable for underfed, old people. In the struggle for life against other members of the species, too, the chances for the underfed animal can hardly be expected to be favorable. Consequently, subnutrition seems to be biologically useful only in senescent individuals not subjected to intensive stresses. This should be borne in mind before recommending subnutrition as a universal means against senescence in the human species, quite apart from its possible deleterious effect in terms of working performance or joy of life. Whether a certain degree of subnutrition might have a favorable influence on the senescence and life span of certain old individuals who live under protected circumstances is a subject for further study.

Growth Versus Senescence

The concept that nutrition, sex, and growth hormone act as factors activating metabolism and thereby indirectly accelerating senescence immediately raises the question of why these factors do not exert an unfavorable effect on young individuals. Teleologically, this would not seem to be rational. Lansing, in particular, has in the last years brought forward evidence that, as long as a tissue or an animal grows—that is, so long as its cells multiply—no manifestations of senescence occur but that, with the arrest of cell division, aging sets in. His theory is based on the early investigations of Sonneborn and on his personal findings

with regard to the life span of growing and nongrowing rotifers.

More than twenty-five years ago, Sonneborn described a fresh water flatworm *(Stenostonum incaudatum)* which procreates in a remarkable manner. The worm forms a new individual by producing a new head at about one-fourth to one-third of the caudal pole. In front of this head, a constriction takes place, and the posterior part of the worm thus constitutes a new individual which detaches itself from the old or anterior part. The old part requires only the formation of a tail to regenerate; the daughter product, however, which consists of only a small part of the previous tail in addition to the new head, must form a considerable quantity of new protoplasm and, consequently, undergoes more growth and cell division. By separating all newly formed individuals from the old, Sonneborn was able to study several generations of this flatworm separately. He found that the average life span of all anterior parts was thirty-five days; of the posterior parts under investigation, 4 died after sixty-four days, 2 lived seventy-seven days and were then lost incidentally, and 2 even reached a life span of one hundred fifteen days, after which the experiment was terminated. In these animals, therefore, cessation of growth seemed to be associated with senescence and shortening of the life span, whereas active growth was associated with a longer life.

Lansing made investigations in rotifers —small multicellular organisms reproducing by parthenogenesis and easily cultured in vitro. In the species studied, an adult individual develops from the ovum after two to three days; then reproduction begins until manifestations of senescence set in after the fifth or sixth day. Lansing compared the life spans of individuals originating from ova produced on the second to third day to those on the fifth to sixth day; he found that individuals produced by younger mothers lived longer than those of older parents. Other rotifer species have a somewhat longer life span, but results were the same in all experiments that enabled a comparison between the life spans of individuals descending from young mothers, hardly adult, if at all, and those descending from old mothers no longer showing any growth.

In the second generation, the difference in life span was even more marked, the degree of difference increasing in subsequent generations until, after a few generations of senile mothers, no viable eggs were obtained. A striking finding was that, when after two generations of senile descent, one generation was again obtained from an adolescent mother, this generation immediately showed a longer life span. It seemed possible, therefore, to neutralize the acceleration of senescence in the offspring of senile mothers. No genetic factor seemed to be involved, but rather an influence originating from the mother and continuing in the daughter animal. This has been referred to by Lansing as the aging factor. Cultivation of the offspring of young, growing mothers through consecutive generations finally led to increasingly growing animals, which reached a larger size and appeared to live considerably longer; in such individuals, the production of ova started later than normal.

Thus, growth appeared to counteract senescence; arrest of growth was associated with senescence, and this appeared to be transmissible by the protoplasmic route.*

In view of these investigations, one is reminded of the lack of senescence in embryos and young animals which can be compared, in this respect, with Carrel's ever-dividing culture of fibroblasts. On the other hand, as Buerger has already pointed out, we recognize the same law in the fact that senescence is especially evident in such organs as the central nervous system and the lens, where the cells no longer divide after the fetal period.

BIOCHEMISTRY

It is obvious that, since so little is known about the chemistry of cell division and growth in the protoplasm, only the vaguest concepts can be formulated regarding the manner in which growth (cell division), metabolic rate, and senescence or life span are interrelated. In some way, cellular metabolism seems to be unfavorably influenced when anabolism or storage is stimulated, as by supply of food, while, at the same time, one of the subsequent metabolic stages, which should lead to an increase in nucleoprotein and thence to cell division, is blocked. It can be imagined that, under these conditions, intracellular protein is converted into fat or other products, such as cholesterol and other lipids and possibly mucopolysaccharides, which might have an injurious effect in the long run, leading to deterioration and death of the cell or, at least, of some cells in which the phenomenon is most marked.

The above considerations on the significance of anabolic excess as a factor promoting aging or senescence are compatible with the general theory forwarded many years ago by Korenchevsky. He maintained that senescence is a sequela of autointoxication, implying that the same metabolic processes which are indispensable to normal life produce, in the long run, the manifestations of senescence that limit the life span of the organism. The chemical nature of this natural autointoxication will only be elucidated by further investigations.

In the majority of higher animal species, including man, the normal life processes are dependent both on life circumstances and habits and on the hormonally determined periods of life. Animals of most mammal species show maximal growth rates during embryonic life; growth continues after birth until sexual maturity is reached and is then arrested or retarded in most species under the influence of the sex hormones. This is demonstrated in the majority of animals by closure of the skeletal epiphyseal lines and by the arrest of growth of other organs, without definite growth lines, after adult age is reached. However, this does not necessarily mean that cellular division no longer takes place.†

The theory of anabolic excess as a senescence-promoting factor explains

*There are indications suggesting that cells originating from younger individuals can be kept longer in culture than those from older individuals. The blood plasma of young animals, moreover, seems to furnish a better nutrient medium for cell cultures than that of older animals. The factors underlying this phenomenon are still insufficiently investigated.

†In some animals, such as rats, the situation is somewhat different in that growth continues for nearly the entire life span, while epiphyseal lines remain open until a very advanced age. This factor should also be taken into account before deciding if the results obtained by McCay in rats are applicable to all mammals. Warmblooded animals are subject to a law according to which smaller species with a more intense metabolism per unit of body surface show a briefer period of growth and live for a shorter time after completion of growth than do larger species.

why, in the majority of warmblooded animals, some of the biochemical senescent processes begin shortly after sexual maturity, when nutrition, growth hormone, and androgens continue to stimulate anabolism. At the same time, growth is arrested until, in advanced age, the loss of endocrine gonadal function, decreased growth hormone production, and diminished appetite lead to an involution which, unless external conditions are too unfavorable, allows of a certain prolongation of life at a lower anabolic level.

The Central Nervous Origin of Biologic Aging

The above hypothesis postulates that the so-called senile atrophy or involution and the corresponding hypometabolism originate from a combination of decreased appetite of hypothalamic origin and decreased gonadal and anterior pituitary (growth) hormone production. The next question concerns the genesis of these senile changes in endocrine functions. The functional endocrine decline of the ovaries and testes, associated with aging, is caused partly by primary ovarian or testicular exhaustion and partly by decreased stimulation from the anterior pituitary. The pituitary itself, as is becoming increasingly clear, receives its stimuli partly as a feedback from the peripheral endocrine glands and partly, via the portal circulation, from certain diencephalic or hypothalamic centers.

In search of the cause of senile involution, therefore, we encounter hormonal changes that are under the regulatory functions of the hypothalamus, which also contains the centers that play a role in the regulation of appetite. This leads us to the hypothesis that *some of the fundamental processes which determine biologic aging are initiated by an exhaustion of certain parts of the hypothalamus.* In other words, biologic aging is a process of a biochemical nature of central nervous system origin. Furthermore, it is interesting to note that other individuals manifest in middle and later life a picture which might be called a counterpart of senile involution—for example, overeating, obesity, diabetes, and other metabolic disturbances—which tend to shorten life. These conditions seem also to be of hypothalamic and pituitary origin. Thus, we postulate that the type of individual senescence, whether it be in the direction of overfeeding, obesity, and diabetes or in the direction of senile involution, is determined by the diencephalon. This is analogous to the manner in which this circuit station governs the type of regulation of so many aspects of the vegetative life of the individual.

Since the diencephalon is closely interrelated with other parts of the central nervous system, this theory of the origin of biologic aging should not be too narrowly confined to the diencephalon. This is particularly important with a view to other influences which, affecting the central nervous system, may become important factors that also determine, albeit indirectly, the type of aging of the individual.

These influences on the central nervous system are partly physiologic and partly pathologic in nature. The physiologic manifestations of senescence are known to the neuroanatomists as (1) a decrease in the number of ganglion cells, (2) a shrinkage of the individual cells, (3) changes in stainability, (4) glia proliferation, and (5) formation of the senile "plaques." These plaques have recently been recognized as consisting of mucopolysaccharides, such as chondroitin sulphuric acid, similar to the senile degeneration of the arterial wall in some laboratory animals.

The cause of this cerebral involution of old age is unknown. There is reason to believe that intense cerebral functioning over a period of many years may hasten the process of aging in the brain; this tallies with the clinical observations that patients who have frequently been subject to emotions and worrying often seem to show early senescence and that those who have kept themselves healthy at an advanced age became suddenly "old" through the loss of a beloved husband, wife, or child.

In addition, the condition, morphologic and functional, of the central nervous system depends largely on its oxygen and food supply. Occlusive vascular diseases, particularly atheroma, arteriosclerosis, and cerebral thrombosis, which increase in extremes and intensity with age, (although they are not inherent to old age as such) also cause functional and structural lesions in certain parts of the cerebrum, diffuse in some cases and more localized in others. Depending on their localization and severity, these vascular disorders of the central nervous system thus contribute to cerebral involution.

The ensuing clinical syndromes depend mainly upon which regions of the brain suffer most from this combination of involution and ischemia. Thus, the deterioration of memory and psychomotor dexterity is probably chiefly dependent upon regressive cortical processes.

However, besides these direct signs of cerebral involution, the *general* senility of patients with diffuse cerebral atherosclerosis or atrophy is a striking clinical observation. The hair is gray, or more usually white, and the skin is slack; there is a deterioration of the control of the excretory functions and cleanliness, leading to invalidity. Such generalized physical aging is often seen after one or more attacks of apoplexy or cerebral thrombosis or in atrophic cerebral disease localized in or near the brain stem.

The practitioner often asks himself why some individuals are healthy and physically and mentally youthful at an advanced age, while others age early, develop senile diseases, and die before the years of the chronologic senium. A comparison between such biologically "old" and "young" aged subjects as to their former ways of living usually reveals that moderation has been a characteristic of the healthy. In general, abuse of alcohol and tobacco and excessive nutrition played no role in the lives of these sound old men. Moderation is not the only factor, however. In the past few years, the author and his co-workers have collected data on the correlation between life events and disease. In this investigation, some biographies of elderly patients were also studied. The findings clearly suggest that anyone who has been privileged to pass his childhood in a stable family and to find reasonable satisfaction in a stable marriage and suitable occupation has a better chance for a healthy old age than those who have been confronted with instability and frustration in childhood, marriage, and work.

All these observations are consistent with the hypothesis that it is the condition of the central nervous system, and particularly of the diencephalon, which determines, albeit indirectly, the other senescent processes of the organism. This most important part of the central nervous system is subject both to the somatic senescent processes of involution and ischemia and to the influence of the func-

tional processes connected with the life experience of the individual. In this way involutional and vascular, as well as psychologic, influences will, in the course of years, affect the condition of this part of the cerebrum, from which, along neural and hormonal pathways, the phenomenon of aging appears in the remainder of the organism.

In this hypothesis, therefore, the function of the diencephalon would not only be the regulation of certain fundamental processes during the life of the individual but also the regulation of the rate and, thereby, the duration of this life itself.

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GENERAL REFERENCES

1. BINET, L. et BOURLIÈRE, F.: Précis de Gerontologie. Paris, 1956.
2. BUERGER, M.: Alter und Alterskrankheiten. Leipzig, 1953.
3. COMFORT, A.: The Biology of Senescence. New York: Rinehart & Company, Inc., 1956.
4. ENGLE, E. T., and G. PINCUS: Hormones and the Aging Process. New York: Academic Press, Inc., 1956.
5. HAVIGHURST, R. J., and R. ALBRECHT: Older People. New York: Longmans, Green and Co., 1953.
6. HIRSCH, S.: Was bedeutet Altern? Med. Klinik 1: 1, 1956.
7. HOWELL, T. H.: Old Age. London, 1950.
8. KORENCHEVSKY, V.: Autointoxications and the processes of aging. Texas Rep. on Biology and Medicine 12: 1006-1036, 1954.
9. LANSING, A. J., editor: Cowdry's Problems of Aging. third edition. Baltimore: Williams & Wilkins, 1952.
10. MONROE, R. T.: Diseases in Old Age. Cambridge, Massachusetts: Harvard University Press, 1951.
11. SHELDON, J. H.: The social medicine of old age. (Abstract.) Nature. London 162: 466, 1948.
12. SLEESWIJK, J. G.: De Ouderdom van geneeskundig standpunt beschouwd. Amsterdam, 1948.
13. VAN ZONNEVELD, R. J.: Gezondheidsproblemen hij Bejaarden. Assen, 1954.
14. VERZÁR, F.: Experimentelle Alterforschung. Basel, 1956.
15. YOUNG, F. G.: The Growth Hormone and Diabetes. Recent Progress in Hormone Research, 0, 1953, 4F1.
16. WOLSTENHOLME, G. E. W., and M. P. CAMEREON: Ciba Colloquia on Aging, volumes I, II, III. London, 1955-1957.
17. Proceedings of the International Congresses of Gerontology: Liège, 1950; St. Louis, 1951; London, 1954.
18. Josiah Macy, Jr., Foundation Conferences on Problems of Aging. New York, 1940, etc.
19. Symposium on Problems of Gerontology of the National Vitamin Foundation. New York, 1954.
20. Modern Trends in Geriatric Medicine. London, 1957.
21. LANSING, A. J.: Some physiologic aspects of aging. Physiolog. Rev. 31: 274, 1951.

A SPECIAL YELLOW tinted lens often may help traveling vision in patients with macular degenerative changes. The lens improves vision on bright sunny days in patients with macular changes. The patient's prescription may be incorporated in the lens, which is made commercially. The patient is also given vitamins and other medication as needed.

L. A. BREFFEILH: Inexpensive visual aid for patients with macular degenerative changes. J. Louisiana M. Soc. 110: 428-429, 1958.

DIFFUSE INTIMAL THICKENING of the aorta increases with age and is more marked in the distal than in the proximal portion. During the first three decades of life, there is little individual variation, but, in old age, the degree of diffuse intimal thickening may vary from case to case. The diffuse thickening of the aorta is considered a normal developmental and aging process and not a part of arteriosclerosis.

H. Z. MOVAT, R. H. MORE, and M. D. HAUST: The diffuse intimal thickening of the human aorta with aging. Am. J. Path. 34: 1023-1031, 1958.

C. A. Stephens—a pioneer

GERALD J. GRUMAN, M.D.
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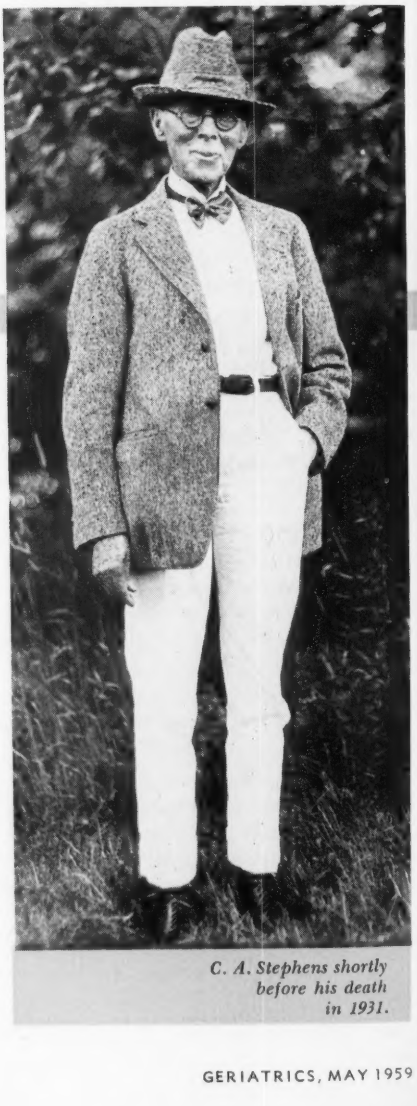
A highly successful author of the 1880s, Charles Asbury Stephens found time to earn his M.D. and do pioneer work in gerontology. Motivated by his philosophy of "natural salvation," he investigated the micropathology of aging and attempted to establish an early institute for gerontologic research.



C. A. Stephens shortly before his death in 1931.

GERALD JOSEPH GRUMAN *is a teaching fellow in the History of Science Department, Harvard University, Cambridge.*

American gerontology

■ It is ironic that C. A. Stephens, one of the most popular writers of his day, probably will be remembered not for his fiction but for his pioneer work in gerontology. As early as the 1890s, Stephens was investigating the aging of blood vessels and neurons, offering prizes for research on senescence and trying to organize an institute of gerontology—activities which have a very contemporary sound. Who was this unusual person, and how did he happen to turn aside from a lucrative literary career to explore new paths in medicine?

Born on October 21, 1844, Charles Asbury Stephens[1] was brought up on a farm near Norway, Maine, now a resort village. His parents, descended from hardy pioneer settlers, were devout Methodists. Vigorous and pious, they farmed a lovely tract of land in the rolling, wooded hills along the shore of Norway Lake. To the west were the White Mountains of New Hampshire and to the north the fabled Canadian forests. Typical of the provincial and rural America of the pre-Civil War era, Stephens' childhood was a round of farm chores, school sessions, prayer meetings, and occasional woodland adventures.[2]

After childhood, Stephens plunged into an intense struggle to achieve higher education and a means of livelihood.[3] Cash was an item in short supply on a Maine farm, so he chopped wood, peddled sewing machines, and taught school to pay his way. He was nearly 25 years old when he finally completed his college courses at Bowdoin in 1869. It was at Bowdoin, with its emphasis on literature and rhetoric, that his writing ability was recognized and encouraged.

The fame and fortune of C. A. Stephens were made in 1870, when his stories attracted the attention of Daniel Ford, the shrewd publisher of the weekly *Youth's Companion*. Stephens and the *Companion* rocketed together to the top position in American journalism. In the 80s and 90s it could be said that, "in three out of every four homes, say in Iowa, you will find the *Youth's Companion*. And the whole family reads it."[4] Whole sections of the periodical were written by Stephens, under various pen names as well as his own.

Then came the surprising decision to go to medical school. Ford wanted someone to undergo medical training and write health articles for the *Companion*, and, in 1884, Stephens volunteered to take the three-year course at the Boston University School of Medicine. It was an arduous assignment for a literary man, already over 40, with a wife and children to think about and a heavy schedule of journalistic duties to be met. His alertness and hard work, however, earned him high grades, and in 1887 he obtained his M.D.

To those who knew him well, Stephens' study of medicine could not have been entirely unexpected. At an early age he had developed a keen interest in science, largely through the influence of two remarkable friends with whom he had

grown up in Maine. One was Addison Verrill, who became professor of zoology at Yale. As "Cousin Addison," he was the hero of many of Stephens' stories. The other was C. O. Whitman, professor of zoology at the University of Chicago and founder of the famous Wood's Hole Marine Biological Laboratory. He and Stephens went to Bowdoin together and shared an ardent interest in religious and philosophic questions.

Those were the days when Darwinism was sweeping America, and the serious and sensitive Stephens responded to the new outlook. He adopted many of the views of Ernst Haeckel, the great German Darwinist who preached the idea of progress, scorned revealed religions, and explained the phenomena of nature by a peculiar type of "vitalist" materialism. According to Haeckel, life and even mind already were present in latent form in the atoms of ordinary matter. Stephens' medical school thesis, "Living Matter,"[5] was largely a competent exposition of Haeckel's philosophy of biology, and many of his later writings are complicated by Haeckelian concepts.

This enthusiasm for science and human progress inspired Stephens to formulate a concept which he called "natural salvation." Since infancy, he had been nourished on Methodist and Universalist controversies about death and salvation. Now it seemed to him that science offered a solution to some of these questions along natural rather than supernatural lines. If society would put enough of its resources into medical research, one disease after another would be overcome, even the problem of old age would be solved, and the span of life would be tremendously prolonged. Such thinkers as Descartes, Francis Bacon, Benjamin Franklin, and the Marquis de Condorcet previously had speculated along these lines,[6] but Stephens gave the outlook a name and attempted to bring it into the laboratory.

It was the idea of natural salvation which motivated Stephens to go to medical school and centered his attention on the study of senescence. In one of the chapters of his thesis, he summarized all the data he could get hold of on the pathology of old age. During the winters of 1890-92, he investigated the histology of old and young dogs obtained from the New York City pound. During the summers, he attended biology courses at Wood's Hole and also fitted up a laboratory at his home in Norway, Maine, where he examined the brain cells of swine and the skin, bone, muscle, liver, and heart tissues of human beings of various ages. Some of this research was included in his book, *Long Life*, published in 1896.[7]

The results of all this effort were not as impressive as one might have hoped. Stephens had neither the training nor the temperament for effective scientific research. He was an "idea man" sparkling with interesting projects but deficient in some of the practical and methodical qualities necessary for success in the laboratory. At times, he hit on highly significant themes, as in his study of aging capillaries and his discussion of the longevity of neurons,[8,9] but his empirical reports were too brief and too few and were sandwiched with ventures in speculative philosophy.

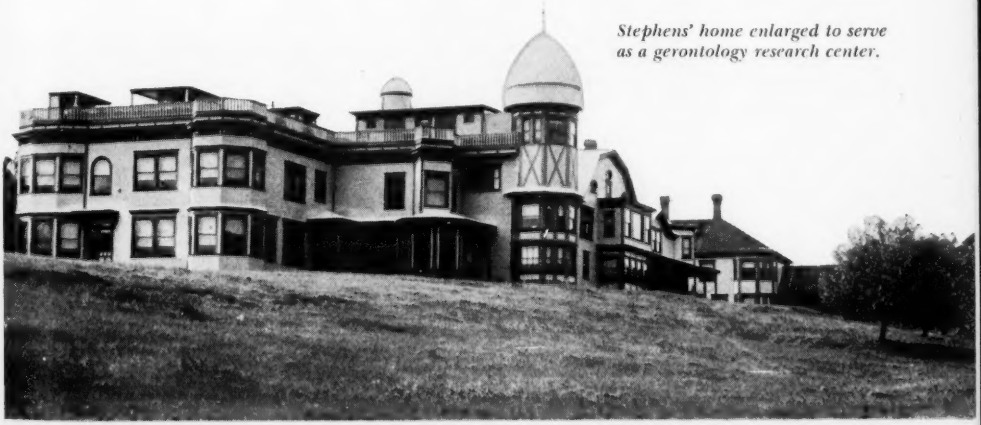
Realizing his own shortcomings in the laboratory, Stephens hoped to attract more competent researchers into the field of aging. With that goal in mind, he published his writings at his own expense and sent them out to physicians and scientists. In 1890, he circulated an

announcement offering 400 dollars in prizes for microscopic demonstrations comparing young and old capillaries in either dogs or human beings.[10] The terms he set were reasonable enough; 24 slides were required, and the appropriate ages were defined as 1 to 3 for young and over 12 years for old dogs and 10 to 20 and over 65 years for human beings. Although quite a few specimens were sent in, some of which he purchased, no full-fledged contestants appeared.

More important was Stephens' endeavor to set up a large-scale research center devoted to gerontology.[11] The plan was for his friend, the eminent biologist C. O. Whitman, to direct the enterprise, and J. C. Coombs, a wealthy corporation lawyer in Boston, to subscribe the funds. How far Coombs, a Bowdoin classmate of Stephens, really committed himself we do not know. At any rate, Stephens, never one for moderation, rushed ahead with the expansion of the Norway laboratory, so that it might accommodate as many as 50 students. When Coombs died very suddenly in 1905, the plan was dashed to the ground. It is possible that Whitman had been genuinely interested in the project. He was a fearless proponent of unorthodox ideas,[12] and he and Stephens kept up an amicable correspondence.

The failure to establish a research institution at such an early date was a serious loss to gerontology. The extent of the deprivation may be judged from a research program drawn up in 1896:

> "a. The condition of the capillaries in age as contrasted with prime, or adolescence, since the blood circulation is here a factor of great interest.
>
> "b. The condition of the cerebral cells at prime as contrasted with the aged condition. Also parallel studies of vegetable cells in young and in age-stiffened plants after florescence and seeding.
>
> "c. More exact determination of the constituents of old and young blood, in connection with abnormal substances of the nature of poisons found in it in aged subjects.
>
> "d. Comparative examinations of the tissues of aged and adolescent subjects, from every organ of the animal body, to learn broadly what the differences are and whether certain organs have a tendency to age more rapidly than others and by their earlier decline to drag down their associate tissues.
>
> "e. Psychical studies of the mental condition of old and young persons, comparatively, as regard the decline in hope-



Stephens' home enlarged to serve as a gerontology research center.

fulness and ambition which characterizes advanced age, as marking a cycle of growth and decline of the personal life in the cerebral tissues.

"f. Observations of the bio-physical effects where new hopes and new ambitions have possessed the intellect, from changed fortune, as showing a potential capacity for a more extended development of the personal life."[13]

Nearly all of these items, if undertaken by qualified personnel, would have produced valuable data for the advance of gerontology.

When Coombs died in 1905, Stephens was already 61 years old, and his chances of contributing to gerontology were practically gone. In 1903, he had published *Natural Salvation*, the book which best expresses his philosophy.[14] Included in it was a moving essay, "The Darkest Hour," in which he faced the fact that, despite the glittering promises of science and progress, he and his generation were doomed to old age and death as all previous generations had been. As far as science and medicine were concerned, he had lost contact with developments. Till his death in 1931, he continued to publish "new" editions of his works, but his ideas, still rooted in the 1870s, became more and more obsolete and eccentric.

Growing up in a period of intellectual ferment, Stephens had had the vision to recognize the potentialities of modern science for the then-neglected problem of aging. At great personal expense, he had tried to overcome the pessimism and apathy which blocked the systematic investigation of senescence and death. Although not well fitted for research, he had carried on pioneer studies in the 1880s and 90s and had tried to organize a large-scale gerontologic laboratory. How much influence he achieved is not known; nearly all his voluminous correspondence, slide collections, and notes were lost in 1954 when his home and laboratory were torn down. If he were to see the geriatrics and gerontology of the present day—the professional organizations, the books and journals, the government research programs and the international congresses—he would be impressed but not overawed. No doubt, he would repeat the provocative message he gave to his own times, "Enlightened man . . . is but just awakening to the idea that he may possibly escape death by setting his wits to work to this end."[15]

This investigation was supported in part by Research Grant M-2163 from the National Institutes of Health, Public Health Service.

REFERENCES

1. CHAMBERLIN, J. E.: Charles Asbury Stephens, in Dictionary of American Biography, vol. 17, Dumas Malone, ed., N.Y.: Scribner and Sons, 1935, p. 577.
CROSBY, K.: More than half a century with C. A. Stephens. Boston Evening Transcript, 1-9-26, Book Section, p. 1.
GRUMAN, G. J.: C. A. Stephens—popular author and prophet of gerontology. New England J. Med. 254: 658-660, 1956.
JUDKINS, E. J.: Bibliography of Charles Asbury Stephens with a Brief Biographical Account. University of Maine Film Series, 1945-1949, Document 2475, ADI Auxiliary Publications Project, Library of Congress, 91 pp.
2. STEPHENS, C. A.: When Life was Young at the Old Farm in Maine. Norway, Maine: The Old Squire's Bookstore, 1912.
3. STEPHENS, C. A.: When the self-sender walked home, in Tales of Bowdoin, J. C. Minot and D. F. Snow, editors. Augusta, Maine: Press of Kennebec Journal, 1901, pp. 67-78.
4. BAKER, R. S.: American Chronicle. New York: Charles Scribner's Sons, 1945, p. 69.
5. STEPHENS, C. A.: Living Matter: Its Cycle of Growth and Decline in Animal Organisms. Norway Lake, Maine: The Laboratory, 1888, 107 pp.
6. GRUMAN, G. J.: Death and Progress: The Evolution of Ideas about the Prolongation of Life. In preparation.
7. STEPHENS, C. A.: Long Life: An Investigation of the Intimate Causes of Old Age and Organic Death. Norway Lake, Maine: The Laboratory, 1896.
8. Ibid.: The capillaries in youth and age, pp. 30-36.
9. Ibid.: Long-lived cells and those which die young, pp. 67-75.
10. Ibid., pp. 30-31.
11. CROSBY, K.: op. cit.
12. MORSE, E. S.: Charles Otis Whitman (1842-1910) in National Academy of Sciences: Biographical Memoirs, vol. 7. Washington: National Academy of Sciences, 1912, pp. 269-288.
13. STEPHENS, C. A.: Long Life, p. 13.
14. STEPHENS, C. A.: Natural Salvation: The Message of Science, Norway Lake, Maine: The Laboratory, 1903.
15. Ibid., p. 82.

editorial

The challenge of geriatrics in medical education

■ The success of modern medicine in prolonging life is bringing an increasing number of oldsters who constitute an unexpected challenge in medical education. They do not know how to take care of themselves, and no one else is properly prepared to do so, either. Their very number makes the problem. For all the centuries of previous human experience with old folks, they could conveniently be diluted out of the scene, usually by family care, sometimes by homes for the aged, often by poorhouses. There was little to do for them medically, except to give them a patronizing word of cheer, and pneumonia usually introduced them pleasantly to death.

This has changed with steadily increasing numbers in the past few decades. There are now startling millions of oldsters in our population, and they pose serious problems in economics, sociology, politics, family relations, and a vast complex of technical medical matters in promoting physical and mental health and in handling the characteristic degenerative physical and mental diseases of old age. The next decade may well bring a crisis in gerontology unless prompt methods are devised for coping successfully with the snowballing situation.

Medical schools have a prime responsibility in tackling gerontology teaching and research and in preparing their graduates for a tremendous jump in geriatric practice. They are the centers to which practicing physicians naturally turn for postgraduate instruction and training, and demands are beginning to come for aid in handling the frustrating diseases of the aged. Unless our medical schools meet this serious responsibility with promptness and effectiveness, there may come an unpleasant scandal in medical affairs, which could adversely affect the traditionally high esteem in

which people hold the medical profession.

General practitioners may well take over the bulk of geriatric practice, and training for general practice in our medical schools could properly include a large amount of gerontology. It is doubtful that there can be much of a specialty in geriatrics as yet, but it may come. So far there seems to be no enthusiasm for geriatric clinics. Perhaps no one wishes to be considered "old." This is a healthy sign, but it would seem to put the matter back in the laps of general practitioners.

A great opportunity for constructive programming in geriatrics lies in the example set at the other end of the life scale, in pediatrics. Pediatricians have been very successful indeed in training women and men how to take care of babies, infants, and children, and the results are amazing. This pediatric program includes the health professions—medicine, dentistry, nursing, public health, dietetics, and other auxiliaries—with special efforts among hospitals, social workers, and publicity experts, with continual articles in newspapers and magazines, and even with classes in our elementary, high, and adult schools.

This same sort of a program might well be developed for geriatrics. It could include all the health professions and auxiliaries, the social workers and churches, our schools, and our publicity media. It could become a systematic effort to publicize the various ways in which effective geriatric care could be rendered and even obtained for oneself.

Its purpose as an organized attempt at personal and social welfare would be to get young people to realize that they inevitably age, but that it is possible to prepare while one is still young for an old age that has dignity, self-confidence, and graciousness. The objectives may be clearly indicated in regard to physical and mental health, economic stability, moral responsibility, and satisfying human relationships. In all this prophylactic old-age program, the general practitioner could well become the guide and leader.

From adolescence on, the general practitioner might direct a systematic preparation of his patients for old age by regular physical examinations, by judicious counseling, and by specific programs of training under expert guidance in diet, exercise, mental relaxation, social attitudes, economic planning, and human relations. Under such an endeavor, the general practitioner might indeed become again the personification of the ideal physician as guide, counselor, and friend. To train general practitioners to accomplish this sort of a mission, medical schools would need to undertake careful organization and skillful planning of specific lecture and laboratory courses in gerontology and of special clinic and family-home team procedures in geriatrics. The subject deserves as full a consideration as pediatrics, and the results could well become as significant.

The family unit is again becoming the center of interest in the medicosocial effort. Medical schools are finding that highly effective general practice can be taught on assignment of students under supervision to a family for the entire period of medical training. Under these conditions, with appropriate teamwork with social workers and other students in the health professions, each member of the family group may receive medicosocial care in a co-ordinated and efficiently economic manner.

This can become a training method of great importance in geriatrics. It can also be used successfully for postgraduate demonstration for general practitioners who may want to learn how modern

medicosocial teamwork achieves such spectacular results. Medical schools have a major responsibility in offering postgraduate training programs for general practitioners.

For the few gerontology specialists who may be needed as geriatric practice increases, the medical schools might plan by appropriate residencies for certification. General practice residencies could well include emphasis on geriatrics, including the details of teamwork co-operation with members of other health professions, social workers, lawyers, and financial advisors. Since the economic aspect of old age is very important in its psychologic and general health relations, it may not be too much to expect gerontologists to become expert enough for advice and guidance on the economic preparation for dignified and self-reliant old age.

In the tremendous increase in the number of older people, medical schools have a major challenge scientifically. We need greatly expanded research and study of the aging process. We need to get verifiable data on the structural and functional changes that occur with aging, and we need to understand the chemical and psychologic adjustments that take place in the aging organisms. This research may include a great variety of pathologic investigations, which may aid in greater control of all sorts of diseases. It should be extended to sociologic surveys about aging, and it certainly should include studies on factors influencing human relations.

Research in gerontology might well emphasize psychologic study, as well as psychopathology and psychiatry. The results of such scientific research into the aging process may fruitfully be applied to the broad program of promoting optimum health for all people. From this may come a fresh and wholesome new stimulus for the entire medical effort.

CHAUNCEY D. LEAKE
Ohio State University, Columbus, Ohio

Job placement and adjustment for older workers

■ In the December issue of this journal, an article on job placement for older workers was presented by Drs. Ross A. McFarland and Frank Randolf Philbrook of Boston. This is a thought-producing article and one that we all should read.

The writers say, when fitting a man to a job, one must not only make sure that he will be productive in the particular job, but will not exceed his physical and emotional ability—thereby causing harm to come to himself or to the equipment of his employer. This problem of course becomes more acute as the worker grows old and perhaps somewhat crippled, rheumatic, or slowed up.

We must face the fact that most of us are physically unfit for many jobs. Most of the men who read this editorial couldn't qualify for work as a laborer or a stevedore, which brings out the important point that we cannot classify all workers into the physically fit and the physically unfit. As Dr. Rusk pointed out a while ago, a man who has only one eye, one leg, severe arthritis, almost no hearing, a bad heart, and a few other

chronic diseases can still work perfectly in many jobs in which he can sit at a bench.

I often tell of the woman I once knew who was so crippled with rheumatoid arthritis that she lived in a wheel chair. She had only one finger that worked, and with this she was able to use a telephone. For years, in spite of this handicap, she ran the best employment office in San Francisco and made a lot of money. I have known several hunchbacks who suffered much pain each day, but who continued to run a good-sized business successfully. For thirty years or more, one of the most active, energetic, and responsible women in a large clinic supervised the work of some 20 other girls. She was a thin little person who looked as if she were constitutionally inadequate, but, in spite of her frail body, she was a tremendous worker. She had a good brain.

I have long felt that doctors, when they organized departments of health in big corporations and started examining applicants for jobs, set up very poor requirements for workers. They have been slow to wake up to the fact that, no matter how bad a physical risk a person may seem to be, he may be unusually well-fitted for some particular job. In such a case it would be most unwise, both for the applicant and for the company, to refuse him the job.

During the war, I often wondered whether the rigid physical requirements for a combat airplane pilot were justified and if it would ever occur to some officers to make a study to see whether these requirements were really advisable. For instance, some of the "Flying Tigers," who did so remarkably well in China years ago, were physically handicapped in one way or another, and would have been thrown out of any military academy. In China, men like Chenault had the wisdom to see that so long as a man could fly marvelously well and could shoot down his opponents, it made no difference if he had two large hernias or a bad heart or deafness in one ear.

Today we are finding that mildly psychotic and mildly epileptic persons can be used in factories in which the manager is sympathetic and has a good understanding of the problems of his workers.

As Drs. McFarland and Philbrook say, there are four methods for classifying workers and fitting them to their jobs—the *intuitive* method, the *disability* method, the *rating* method, and the newest, the *specific* method.

The intuitive or guessing method sometimes works, but it is not ideal. In the disability method, jobs are classified according to the various disabilities that the workers in them can have—for instance, jobs for one-armed, one-eyed, or one-legged persons or elderly persons. Not enough care is taken to find out what the man can really do. The last time I was in Dr. Rusk's hospital in New York, I marveled at the energy and ability of the man who was in charge of the brace and prosthesis shop. The man was badly crippled and was able to get around only with crutches and a number of braces. Apparently he had an indomitable will, plus great mechanical genius. These two factors would be immensely more important than the attributes he didn't have.

In the rating method, which is widely used today, jobs are rated as arduous, moderate, light, or very light, and workers are rated according to their qualifications or strengths. Even this method often misses the mark in placement work for there are too many opportunities for misinterpretation. Too often a worker is excluded from a suitable job because someone thought it would be beyond

the range of his ability. Perhaps he was listed as having heart disease, and the man who made the listing did not know that many a man who has had a coronary thrombosis has just as good wind and strength as he had before.

The specific method deals directly with the positive abilities of individual workers and the specific demand of individual jobs. For instance, there are certain jobs which require manual dexterity and my impression is that if the man has such dexterity and can do his job, the employer should close his eyes to everything else about the man.

Sometimes a manufacturer will find a certain woman who does not look any different than any other woman, yet she has an uncanny ability to put together or assemble a small and intricate bit of machinery. Skills which she perhaps developed at her sewing machine may be tremendously helpful when she starts putting together a tiny electronic valve tube. If she can build such tubes rapidly and accurately and if she enjoys doing it, what difference does it make if she has high blood pressure, diabetes, and a bad phlebitis in one leg?

There is one point, however, in all this business of employing somewhat crippled persons—a point that worries me, and this is the question: What will industrial accident commissions do when one of these persons has a little stroke and dies, or has a convulsion and falls against a hot radiator and gets burned? Will the industrial accident commission, in its anxiety to stand high with labor, soak the kind, humane, generous employer for everything that the law allows, and even more than that?

I imagine that all industrial plant physicians who are trying now to solve this problem of employing physically handicapped persons will have to spend much effort to build understanding as well as sympathy into the minds of the men who preside over hearings of industrial accident and industrial health commissions. Their sympathy must be not only for the man before them, but for crippled workers everywhere who need a job.

WALTER C. ALVAREZ, M.D.

Apartments for old people

■ In the *Journal of the Iowa State Medical Society* of December 1958, there is a description of one of the villages of the type which will probably be duplicated soon all over the country—villages designed for older people in retirement. The project is developing on the outskirts of Hastings, Nebraska, and is called "The Good Samaritan Village," because it is sponsored by the Good Samaritan Society, an organization related to the Lutheran Church. There are already 450 apartments in one-story concrete structures, which were occupied by federal government workers during World War II. In this village there will be every type of living arrangement, depending on the needs of the individual couple. Some couples can take entire care of themselves, while others will need help. In some cases, one person will be in bed, and, in other cases, the spouse will need a wheel chair. The cost per month will range from $85 to $150 per patient.

At present, there is only a small infirmary, but a larger one is planned; there is also a department of physical and occupational therapy, and a dental office. Future plans include a shopping center, a chapel, a park, and a small lake.

WALTER C. ALVAREZ, M.D.

This section of Geriatrics *is open for informal comment from readers. Publication of letters is subject to editing and availability of space.*

letters to the editor

UNESCO Looks At Old Age

TO THE EDITORS:

Those enlightened individuals all over the world who are aware of the wide interests and activities of UNESCO may well rejoice that *UNESCO Courier* is so skillfully edited by Dr. Sandy Koffler and his associates. Ronald Fenton is now associate editor for the English edition. Outstanding is the extent of scientific material published in the *UNESCO Courier*. Of current interest is the October 1958 issue containing a considerable amount of material relating to aging.

The general problems of aging are well discussed by Dr. R. E. Tunbridge, professor of medicine at the University of Leeds, who specializes in geriatrics. He was chairman of the organizing committee of the Third International Gerontological Congress, and is active in the efforts of the World Health Organization and UNESCO.

Dr. Tunbridge calls attention to the enormous increase in life expectancy as a result of advances in medical science, but he points out that we have by no means approached an understanding of senescence. Further he calls attention to the great magnitude of the medicosocial problems associated with aging, and concludes, "Aging therefore has scientific, economic, social, and political significance for the community as well as for the individual, and—with all its ramifications—justifies consideration as a major biological problem of the second half of the 20th Century."

He goes on to discuss senescence with respect to metabolic factors, overeating, tissue changes, and proneness to specific diseases. He indicates the world-wide interest in problems of aging, particularly in regard to loneliness, insecurity, and lack of funds for adequate care.

The discussion by Dr. Tunbridge is extended by reference to various attempts in different countries to help solve the individual and social problems brought about by the great increase in the number of old people. There is thus an illustrated section devoted to Denmark's community for old folks, an illustration from the Atami Old Peoples Home in Tokyo, a remarkable description of Dr. John B. Cummins, who at 98 is still practicing vigorously in Fort Worth, Texas, and an illustration from Israel of a trend away from old age homes, by getting oldsters into active service along with others.

The article is well illustrated and calls attention to many of the great world leaders, who made some of their outstanding contributions in old age. Some of these were brilliant artists like Sophocles, who wrote some of the finest Greek tragedies in his 80s; Titian, who was 95 years old when he completed his masterpiece, *The Battle of Lepanto;* Goethe, who completed his great poem *Faust* in his early 80s; and Verdi, who wrote some of his finest music in his 80s.

Professor G. Z. Pitskhelauri adds an interesting thought to the discussion by looking forward to man's life span as embracing a round century. He illustrates a centenarian choir in the Soviet Republic of Georgia, and refers to the detailed study of long-lived persons in the Soviet Republic of Georgia, now being made by the Georgian Institute of Industrial Hygiene. Some of the factors that seem to be involved in cheerful old age are good climate, steady work, long and tranquil family life, simple diet, and pleasant

social surroundings. Maybe we can train ourselves by these means to attain self-confident dignity in old age.

UNESCO deserves wide credit for indicating the world-wide importance of aging. Maybe through UNESCO there can be world-wide efforts at managing some of the problems of senescence that are common to peoples everywhere.

CHAUNCEY D. LEAKE
The Ohio State University, Columbus 10, Ohio

Angiography for Diagnosis of Stroke

TO THE EDITORS:

Dr. Kuhn's plea for more precise delineation of the "stroke," as stated in his article "Diagnostic Considerations in Patients with Stroke" in the March issue of *Geriatrics,* is certainly commendable. The use of angiography for this purpose is most likely to be definitive in cases of cerebral aneurysm, neoplasm, and occlusion of the carotid artery; indeed, all seven of his cases are of these types. Our pathologic observations suggest that occlusion of the carotid artery in the neck is a relatively rare occurrence, though one well worth recognition. Such carotid occlusion may be observed as well in the absence of clinical or pathologic evidence of brain damage. Cerebral aneurysms form a well defined entity which also accounts for only a small proportion of strokes.

The most common form of cerebral lesion associated with a clinical "stroke", at least in our pathologic material, is infarct of the brain, due presumably to vascular occlusion of an intracerebral artery. Pathologically, the identification of the site and nature of this vascular occlusion by anatomic dissection has proved inexplicably difficult. It would be of great interest to know if angiography during life proves more successful in these cases.

In skilled hands, such as those of Dr. Kuhn, angiography has become an increasingly safe procedure, but it would be well to note that one still observes unfavorable and even fatal results following and attributable to angiography. This seems to occur particularly in individuals with necrotizing or hemorrhagic lesions in the brain, such as may be anticipated with clinical "strokes."

Advances in this field will certainly depend on those who, like Dr. Kuhn, strive to define and delineate the pathogenetic factors involved in the different forms of vascular disease.

IRWIN FEIGIN, M.D.
New York City

TO THE EDITORS:

I enjoyed Dr. Kuhn's article entitled "Diagnostic Considerations in Patients with Stroke" in the March issue. He quite advisedly points out that the term stroke is generally a poor one and should not be used since it refers to at least two separate pathological and clinical entities in which the treatment differs as in cerebral thrombosis and hemorrhage.

I would take exception to some of his discussion on the symptomatology of carotid artery thrombosis. For example, he states that hemiplegia usually accompanies this condition though it by no means is essential. I believe, as do most other neurologists and neurosurgeons who have had a good deal of experience with this problem, that there is no typical picture of cervical carotid artery thrombosis and that it may resemble any neurological and neurosurgical lesion in the book. Another important point of disagreement is that Kuhn states carotid thromboses (strokes) are customarily abrupt in onset. Since we have been looking for this lesion by arteriography the past five or six years, I have been quite surprised how often the onsets are gradual. Actually some of these have taken several months and longer to develop. There is no history nor are there any typical findings that characterize a cervical artery thrombosis, including even palpation of the cervical vessels.

At the end of his case 4, he comments that there is a limitation in diagnostic value of gas contrast studies (pneumography) and at the same time illustrates the value of arteriography for actual localization of expanding intracranial tumors. My own experience has been just the complete antithesis. Within

the past six months or so I have had several patients in whom the arteriogram was perfectly normal and a pneumoencephalogram immediately afterward showed an expanding intracranial lesion in the anterior half of the cranial vault. Arteriography is best for vascular lesions while the air studies should be used when an expanding lesion is anticipated.

Certainly he is correct in advocating arteriography in such older patients where the diagnosis is a real possibility. However, I would be reluctant to concede it is a completely innocuous procedure. The more arteriography is performed on older geriatric patients with atherosclerosis, I believe the greater the incidence of complications will be than in the younger geriatric group. Subintimal hematomas have occurred from time to time further occluding the carotid flow of blood and increasing the neurological deficit. With the degenerated intima becoming more easily separated from media, the bevel of the needle can in part be subintimal and with a forceful injection of dye separate and elevate the intima for a distance. This should in no way deter one from performing arteriography in this age group, for the advantages far outweigh this disadvantage.

The author mentions the use of the external carotid artery in bypassing a thrombus and joining it to the internal carotid above. It should be pointed out that this artery is very frequently one in which the collateral circulation is or has developed for the intracranial supply and that the blood passes through the external carotid through the ophthalmic division and then in turn to the siphon intracranially and of course then on to the middle and anterior cerebral maintaining blood flow for cerebral function.

I think the author has stressed many good points that the internist and general practioner can well utilize. There are certainly a moderate number of patients that can therefore be prevented from living an invalid existence if handled as Dr. Kuhn has outlined.

IRA J. JACKSON, M.D.
University of Texas, Galveston

A Useful Device for the Hemiplegic Patient

TO THE EDITORS:

I should like to report a method for caring for one's nails, which I have learned as a hemiplegic patient. An ordinary fingernail clipper is needed for the disabled hand, and, for the unparalyzed hand, whetrock or whetstone, so-called by farmers who use it to sharpen their scythes. It is a piece of something like sandstone, and is 9 inches long, 1 inch wide, and about one-half inch thick. With these two implements a patient can manicure his own nails in a very few minutes. It gives a great feeling of relief to help oneself in this way and do away with another dependency.

This whetrock costs only about 25 cents and will last indefinitely. The stone will also serve as a hand to steady the paper while writing.

GROVER WILKES, M.D.
Sylva, North Carolina

Information Requested on Professional Openings

TO THE EDITORS:

I am interested in contacting people representing organizations having domestic or foreign interests who can offer opportunities for retired professional persons in the age group 65 to 70 for continuing services, either full or part time, in professional or nonprofessional fields, at home or abroad.

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References:

1. Alexander, L.: J.A.M.A. 166:1019, March 1, 1958.
2. Current personal communications; in the files of Wallace Laboratories.
3. Pennington, V.M.: Am. J. Psychiat. 115:250, Sept. 1958.

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Current Problems in the Surgical Treatment of the Biliary Tract

F. GLENN. Am. J. Surg. 97: 3-16, 1959.

Operation on the biliary tract constitutes the most frequently performed surgery in the hospitals of the United States. Evidence indicates that the incidence of gallstones is increasing in our population, and it is estimated that over 10 per cent of adults have calcareous billary tract disease. A classification of biliary tract disease as viewed from the surgeon's point of view is presented in common terms.

The pathogenesis of biliary tract disease lends itself to division into 4 stages, which occur in sequence and can be readily demonstrated by the clinical symptoms or pathologic findings. Each stage may undergo phases from which it recovers with or without structural changes.

In stage 1, cholelithiasis is present, but the gallbladder functions well, as demonstrated by cholecystography, and is normal in appearance or slightly thickened. Also included in this stage is recurrent acute cholecystitis without cholelithiasis resulting in minimal changes of chronic cholecystitis.

In stage 2, the stones have been present for a considerable time and the gallbladder is thickened and enlarged, with impairment of function. In 7 to 15 per cent of these cases, stones are present in the common duct. The liver appears grossly normal, but scarring may be present on microscopic examination. The ordinary patient with chronic cholecystitis and cholelithiasis falls into this group.

Stage 3 represents an advanced development. Stones have been present in the gallbladder for some time, and the wall of the gallbladder is contracted around them. The gallbladder no longer functions. Stones in the common duct are more frequently present than not, and biliary cirrhosis may be found.

In stage 4 are those conditions that, although preceded by those in the first 3 stages, actually constitute distinct entities from the standpoint of manifestations and pathology. Included in this category are (1) cirrhosis of the liver and benign stenosing fibrosis of the ductal system, (2) biliary enteric fistulas, and (3) neoplasms, including papillomas and carcinomas of the gallbladder as well as carcinoma of the bile ducts.

Recent Advances in the Care of Fractures in the Aged

E. M. BICK. New York J. Med. 59: 461-465, 1959.

Recent investigation has focused attention on the problems involved in fractures in aged persons. The continual rise in our aged population and the ever increasing rate of accidents in this group make clear the necessity for anticipation of such problems.

One of the most common fractures occurring in the older age group is the fractured hip. Current concepts favor the use of internal fixation and early ambulation; the question of hip replacement by prosthetic devices as immediate fracture treatment remains in controversy. Older osteoporotic patients with vertebral compression fractures are now treated with a minimal period of bed rest, followed by rehabilitation with a light brace or corset.

In dealing with fractures of the long bones, several generalizations have been advocated:

- The lessened ability of the older patient to withstand shock necessitates a longer period of rest and stabilization between trauma and definitive therapy.
- Since the osseous tissues of the older person are frequently soft and unable to withstand various leverages and metallic substances, a functional rather than an anatomic alignment is of greatest concern.

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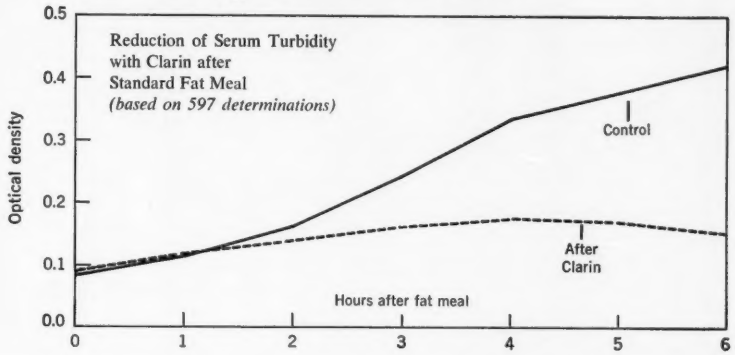

Each time your patients eat a substantial fat-containing meal, lipemia results. Small amounts of injected heparin will help control this increased fat content in the blood,[1,2] but widespread adoption of this method has been hampered by its inconvenience, pain, cost and the necessity for periodic checks on blood clotting time.

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With one mint-flavored CLARIN tablet under the tongue after each meal, lipemia is regularly controlled, removing a constant source of danger to the atherosclerotic patient. He may eat safely, with less fear of dangerous results, without hard-to-follow diets.

The varied implications of CLARIN in beneficially affecting fat metabolism are obviously far-reaching. The relationship between heparin, lipid metabolism and atherosclerosis may well be analogous to that between insulin, carbohydrate metabolism and diabetes mellitus.[5]

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1. Council on Drugs, J.A.M.A. *166*:52 (Jan. 4) 1958. 2. Hahn, P. F.: Science *98*:19 (July 2) 1943. 3. Fuller, H. L.: Angiology *9*:311 (Oct.) 1958. 4. Rubio, F. A., Jr.: Personal communication. 5. Engelberg, H., *et al.*: Circulation *13*:489 (April) 1956.

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digests (Continued from page 66A)

● Because older connective tissues demonstrate a loss of elasticity, postfracture resistance and mobilization exercises must be individualized to purposeful activity.

The differences in the treatment for various age groups appears to be related to the available methods of therapy and the timing of their application. In considering all fractures in the geriatric group, one must be constantly aware of the process of ossification and its relationship to adequate protein intake.

The Surgery of the Endocrine System in Carcinoma of the Breast

J. HADFIELD. Postgrad. M. J. 34: 628-631, 1958.

Metastatic cancer may be treated either by excision of endocrine glands (surgical deprivation) or administration of hormones (addition therapy). The purpose of surgical deprivation is to terminate the production of the specific hormones essential for the proliferation of malignant growths.

Bilateral oophorectomy and adrenalectomy are used to abolish the production of estrogen and progesterone, although oophorectomy is advantageous only in the premenopausal patient. Adrenalectomy may be of benefit when (1) progression of disease follows a growth regression induced by previous oophorectomy, (2) the estrogen level is high even after oophorectomy, and (3) a woman continues to produce estrogen after the menopause. The cytology of the vaginal smear provides a reasonably accurate appraisal of estrogen production.

The aim of hypophysectomy is to abolish the production of those hormones concerned with normal mammogenesis, which are probably prolactin and somatotrophin. The trophic hormones, ACTH and gonadotrophin, which control the production of estrogen by the adrenal and ovary, are also eliminated by this procedure. Patients suitable for hypophysectomy are those in whom estrogen production is low or has ceased and who may or

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 (Continued from page 68A)

may not have had previous hormone deprivation and those with progressive disease following oophorectomy and adrenalectomy.

Effect of Mixed Fat Formula Feeding on Serum Cholesterol Level in Man

S. A. HASHIM, R. E. CLANCY, D. M. HEGSTED, and F. J. STARE. Am. J. Clin. Nutrition 7: 30-34, 1959.

Mixtures of saturated and polyunsaturated essential fatty acids may act synergistically and lower serum cholesterol.

In 10 patients with hypercholesterolemia, formula feeding experiments were carried out in which the 2 fats, safflower oil and an equal mixture of safflower and coconut oils, were compared with regard to their effect on serum cholesterol. A marked decrease in serum cholesterol was seen when either of the fats was administered. The mixture effect was noted regardless of whether it was fed before or after the safflower oil.

The hypotheses that the serum cholesterol-lowering effect of a dietary fat is proportional to the iodine value or the linoleic acid content of the fat are not substantiated by these results nor is the thesis that the saturated fats counteract the effect of polyunsaturated fats. The experimental method employed for the comparison of 2 dietary effects on serum cholesterol level in man eliminates the subjective evaluation of plateau levels and randomizes the effects of variables in time and methodology of lipid determination.

Caution against the belief that the saturated fats are bad and that essential fatty acids are good is suggested.

Paraesthesia in the Hands

P. K. THOMAS. Brit. J. Physiotherapy 11: 16-20, 1958.

Tingling in the hands is a common complaint that deserves more attention than it normally receives. The condition may be attributed to many causes, and the disturbance to neural function may be at any level from the sensory cortex to the peripheral nerves innervating the hands. Only the common conditions usually entering into the differential diagnosis are discussed.

The carpal tunnel syndrome is encountered most frequently in the middle-aged overworked, and rather obese housewife who complains that she is awakened at night by painful numbness and tingling of the hands. If a careful history is taken and the terminal distribution of the median, ulnar, and radial nerves is recalled, it will be recognized that the burning paresthesia affects the lateral 3½ digits—the points of distribution of the median nerve. It is now fairly clear that the mechanism involved is ischemia produced by compression of the median nerve as it passes beneath the flexor retinaculum at the wrist. Symptoms may be reproduced by occluding the circulation with a sphygmomanometer cuff for thirty to sixty seconds.

Damage to the ulnar nerve at the elbow is another common cause of tingling in the hand. Ulnar neuritis may occur where the groove between the medial epicondyle of the humerus and the olecranon process of the ulna is unusually shallow, exposing the nerve to repeated minor injuries. The tingling may be a late sequel to a previous supracondylar fracture of the humerus or the result of osteoarthritis of the elbow. Initial symptoms include pain and tingling over the medial border of the palm and in the fourth and fifth fingers.

A cervical rib or a fibrous band that passes from its tip to join the first rib may produce two clinical syndromes, although most of these ribs are asymptomatic. The neural syndrome produces sensory symptoms of pain and paresthesia over the fourth and fifth fingers, medial border of the hand, and distal portion of the medial border of the forearm. Motor symptoms of weakness and wasting of the small muscles of the hand may also be present. Diagnosis is by x-ray demonstration of the rib.

Paresthesia in the hands may also be caused by polyneuritis, multiple sclerosis, and, finally, cervical spondylosis, which may produce tingling or pain in the region of the neck and shoulder that radiates down the arm. In the latter, osteophytes or prolapse of

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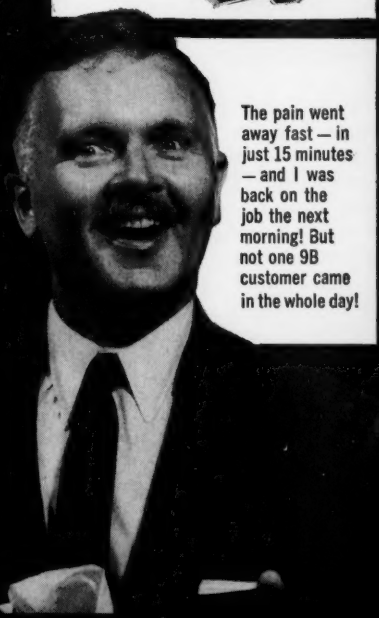

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*U.S. Pat. 2,628,185

 (Continued from page 70A)

an intervertebral disk may cause compression on the nerve roots. Reduction of disk spaces and narrowing of the intervertebral foramina by osteophytes, as seen on roentgenograms of the cervical spine, help to make the diagnosis.

Paroxysmal Ventricular Tachycardia: A Clinical and Electrocardiographic Study

G. R. HERRMANN, H. M. PARK, and M. R. HEJTMANCIK. Am. Heart J. 57: 166-176, 1959.

Paroxysmal ventricular tachycardia (PVT) produces serious complications and must be promptly recognized and halted to forestall dissolution.

Symptoms include rapid palpitation, augmented precordial activity, severe dyspnea and acute pain of relative coronary insufficiency or of actual coronary thrombosis, extreme weakness or prostration, or general circulatory collapse or blackout.

Rapid heart action, sometimes barely recognizable as irregular and not responsive to carotid sinus pressure or vagus nerve stimulation, is a sign of PVT. An occasional transient rise or, more frequently, a fall in blood pressure accompanied by one or more of the reliable signs of heart disease may be a presenting manifestation. Syncope, collapse, and acute left heart failure with pulmonary edema are often signs of the disorder.

On physical examination, PVT is suggested by (1) slight irregularity with rates differing by 5 to 7 beats from minute to minute; (2) occasional giant waves in the jugular pulses; and (3) changing intensity and quality of the first heart sound in the presence of tumultuous precordial sounds of low frequency, which are staccato in type.

Diagnosis can be made with certainty only after careful analysis of the electrocardiogram. The features which confirm the diagnoses are (1) the presence of runs of abnormal ventricular complexes varying slightly in contour due to occasionally superimposed P waves; (2) the establishment of atrial complexes (P waves) occurring independently and usually at a slower rate, rarely retrogradely; and (3) the finding of isolated ventricular complexes before and after a paroxysm with the same form as those recorded during the paroxysm.

Early Diagnosis of Chronic Simple Glaucoma

W. H. HAVENER. Postgrad. Med. 25: 148-151, 1959.

Approximately 12 per cent of the cases of blindness in the United States is due to glaucoma.

Adequate supervision of glaucoma treatment requires the services of an ophthalmologist. Chronic simple glaucoma is the most common type, affecting approximately 2 per cent of persons over 40 years of age. This condition should be readily diagnosed by suspicion in the age group over 40, especially in the presence of family history of eye disease since glaucoma is hereditary; structural defects, such as a small cornea or shallow anterior chamber; or vague ocular symptoms. Characteristic symptoms, in addition to arcuate scotoma, are frequent, unsatisfactory changing of glasses and unexplained aching about the eyes. When chronic simple glaucoma is discovered as a result of the patient's complaints, it is usually too late for action. Preservation of vision is possible only by early diagnosis. This can be accomplished by performing routine screening examinations in all patients over 40 years of age who present any of the aforementioned symptoms. Tonometry is mandatory for accurate diagnosis and may have to be repeated in certain cases if the first reading is normal.

If discovered early, the great majority of cases will respond well to the proper use of miotics. In advanced stages, the disease is unresponsive to medical or surgical therapy and often progresses to blindness.

The Care of the Chronic Asthmatic in Winter

J. L. LIVINGSTONE. Practitioner 181: 693-697, 1958.

It is reasonable to use steroids as a temporary treatment over a period of a few days in cases of status asthmaticus or sharp exacerba-

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estrogen component of "Formatrix" stimulates blastic activity, thus aiding calcium and phos- s deposition; it also imparts a feeling of "well- ." The anabolic action of methyltestosterone pro- the synthesis of protein and restores a positive nitrogen balance. Together, these hormones have a greater effect on bone and protein metabolism than either alone, and side effects are minimized because of the opposing action of the two steroids on sex-linked tissues. Vitamin C plays an important role in formation of intercellular cement substance and amino acid synthesis. "Formatrix" has a large amount of vitamin C to aid in new bone matrix formation and to further help in the healing of fractures.

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2.

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3.

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tions of asthma with respiratory infections. However, the patent steroids have serious side effects and should not be prescribed lightly. Hospital observation two to three weeks prior to steroid treatment is advisable A radiogram of the chest to exclude tuberculosis is essential.

Perhaps the most troublesome ill effect is the difficulty of withdrawing steroid treatment. On no account should the drug be withdrawn suddenly because of the relative atrophy of the adrenal cortex.

Prednisone in high dosage is advised for infective asthma until wheezing and production of sputum have ceased for a week. The patient should be warned of the side effects, especially peptic symptoms. Snacks between meals should be taken.

As most types of asthma become worse in the house, a real effort should be made to diminish the allergens in the home. Strict avoidance of allergens is important.

At the onset of a fresh infection, as recognized from previous attacks, the patient should stay in bed for forty-eight hours and gargle frequently the first day. Antibiotics should be given if the infection spreads to the bronchi with simultaneous administration of extra vitamin B.

A practitioner should use his authority as medical adviser to urge a move to a suitable climate, and a physiotherapist can do much by teaching proper use of the respiratory muscles.

The nebulizer giving a spray of adrenaline and other drugs provides excellent palliative treatment but should be used sparingly and not as primary treatment.

Prophylactic Tracheostomy in Aged and Poor Risk General Surgical Patients

T. E. STARZL, W. H. MEYER, and J. J. FARRELL. J.A.M.A. 169: 691-695, 1959.

The most common postoperative complications are related to the respiratory system and tend to be especially prevalent among aged and poor risk general surgical patients. These complications can be predicted with a high degree of accuracy on the basis of the preoperative history and physical examination. Prophylactic tracheostomy, performed in the operating room immediately after completing the primary procedure or during the first postoperative hours, will prevent respiratory complications and allow maximum utilization of pulmonary reserve, thereby permiting major surgery to be performed under conditions that would otherwise have been hopeless.

Scrupulous care of the tracheostomy is essential; this includes continuous nursing care, systematic and effective aspiration of secretions, aseptic precautions, and humidification of the inhaled air or oxygen. The total period of hospitalization is not significantly increased by the presence of the tracheostomy.

The judicious use of tracheostomy will extend the limits of operability to include aged and poor risk patients who might not otherwise be expected to survive a major surgical procedure.

Association of Gastro-Duodenal Lesions with Meniere's Syndrome

R. WYBURN-MASON. Brit. M. J. 5114: 79-83, 1959.

Functional association has been demonstrated between the inner and external ears and the upper gastrointestinal tract. Irrigation of the external ear with cold water elicits nausea and motor changes in the duodenum. Labyrinthitis may result in Ménière's syndrome, which includes several gastrointestinal symptoms, such as nausea and vomiting, as well as vertigo, tinnitus, sweating, faintness, vasomotor changes, and, occasionally, actual syncope. Conversely, irritation of the stomach and duodenum by poisonous substances or other agents or by gross distention often leads to nausea, vomiting, sweating, tinnitus, and vertigo.

A recent observation has been the apparent causal relationship between labyrinthine disturbances and gastroduodenal lesions; several cases have been seen in which such a relationship was present. In 5 cases, symptoms of paraesophageal hernia, gastric and duodenal ulcers, adult pyloric stenosis, and di-

verticula of the duodenum preceded or coincided with signs of Ménière's syndrome; in 6 other instances, the syndrome was associated with duodenal ulcer.

Exacerbation of the symptoms of Ménière's syndrome usually coincides with an increase in those of the gastrointestinal disturbance. Surgical or medical treatment of the gastroduodenal lesion appears to cure or stop the progress of the labyrinthine disturbance.

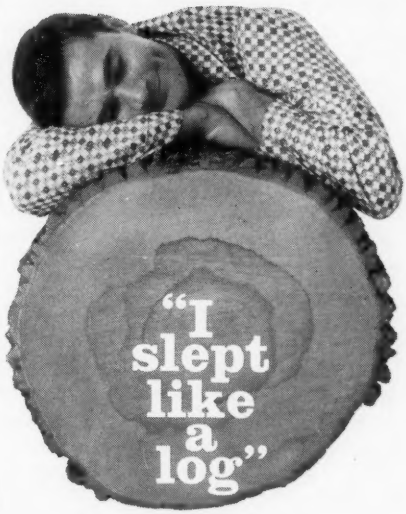
The Role of Radiotherapy in Gynecology

H. L. KOTTMEIER. Postgrad. Med. 25: 124-130, 1959.

The value of radiation therapy in certain gynecologic conditions has been well established. Therapists and gynecologists utilizing such methods of treatment must be thoroughly familiar with the anatomy, pathology, and physiology of the organs involved as well as with the nature and action of the particular form of radiation employed.

The primary objective is eradication of the neoplasm with preservation of the integrity of normal tissue, such effect occurring because tumor cells with their mitotic activity are more susceptible to destruction by x-ray. In considering the use of x-ray to the pelvic areas, one must be concerned with the other organ systems in the area, the amount of tissue to be irradiated, the age and general health of the patient, and the possible use of fractional treatment.

Carcinoma of the uterine cervix is treated with a combination of radium and x-ray in a fractional high intensity technic. The intrauterine applicators deliver 75 r per hour, and the intravaginal applicators carry 60 to 80 mg. of radium. These applicators are left in position for twenty-seven to thirty hours, and, three weeks later, the entire radium application is repeated; this scheme delivers an optimal dose of 4,000 to 5,500 γr. In the usual case, external radiation is given to the parametrium and pelvic lymph nodes via 4 portals over a period of twenty-four to thirty-six days, beginning three weeks after



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 (Continued from page 81A)

the final radium application. In advanced stages of this cancer, telecobalt and radioactive gold injections are used. Using such methods, an over-all five-year cure rate of 50.5 per cent has been recorded; reirradiation is used only for palliative therapy.

Carcinoma of the endometrium must be carefully differentiated histologically, since a highly differentiated adenocarcinoma limited to the corpus is best treated by panhysterectomy, postoperative irradiation, and vaginal radium application; anaplastic carcinomas are best treated by primary radiotherapy.

Carcinoma of the ovary is frequently treated by surgical methods. Recurrences of the tumor are frequently located in the small pelvis, hence preservation of the uterus for use as a receptacle for radium applicators is of considerable importance. Radiosensitivity of an ovarian neoplasm cannot be determined from the microscopic appearance of the growth, and, at times, irradiation will bring about a considerable and unexpected improvement. Therefore, results have been much improved by combining surgery with the fractionated type of irradiation. When the ovarian carcinoma is found to be intimately adherent to the surrounding organs at the initial surgical exploration, the abdominal cavity is immediately closed and irradiation therapy instituted. Ten days after completion of the x-ray treatment, the surgical dissection is done with considerably greater facility. For control of ascitic or pleural fluid formation, radioactive colloidal gold offers a palliative effect.

Ovarian dysgerminomas, which are often unilateral and do metastasize, are radiosensitive, and excellent results may be anticipated following treatment. Granulosa cell tumors of the ovary do not need irradiation if adequately treated by operation. Mesonephromas, mesoblastomas, and metastatic ovarian carcinomas are considered to be radioresistant.

Irradiation is also of use in the treatment of abnormal uterine bleeding, endometriosis, chronic pelvic inflammatory disease, and tuberculous salpingitis.

Sympathectomy for Hypertension; Follow-Up of 212 Patients

C. P. NEWCOMBE, H. S. SHUCKSMITH, and W. S. SUFFERN. Brit. M. J. 5115: 142-144, 1959.

Sympathectomy was performed on 212 hypertensive patients from 1947 to 1953, with an operative mortality of 4 per cent. The procedures used were: Grimson et al. (7 bilateral and 1 unilateral), Adson et al. (39 bilateral and 21 unilateral), Smithwick and Thompson (82 bilateral and 17 unilateral), and thoracic (36 bilateral and 9 unilateral).

Since the changes in fundi, reduction of blood pressure, and symptomatic relief did not necessarily bear any relation to the extent of the sympathectomy, the Adson operation confined to the abdomen became the usual procedure for patients over 45 with severe headache. If the effect was substantial, the second side was not done.

Most of the patients were in the fifth decade, with a preponderance of women. A full clinical evaluation was made preoperatively, with special attention given to any renal cause of hypertension or evidence of pheochromocytoma. Unless cardiac infarction or cerebral thrombosis had occurred in the previous three months, the operation was done when the diastolic blood pressure was more than 110 mm. Hg in patients in whom the symptoms were caused by hypertension and urea clearance was not less than 20 per cent. All patients with grade 4 fundi (Keith-Wagener), papilledema, and exudates were operated upon unless the BUN was greater than 100 mg. per cent.

The survival rate of 76 per cent for five years is in accordance with other published records of patients treated by sympathectomy and contrasts favorably with any published series treated conservatively. A sustained reduction of diastolic pressure of more than 20 mm. Hg occurred in 27 per cent, but, more important, the patients treated had considerable subjective improvement and led more useful lives, even though the initial blood pressure fall was not maintained.

Clinical findings in 900 patients show the selective antihypertensive action of Singoserp

IN 735 PATIENTS, BLOOD PRESSURE FELL AN AVERAGE OF 30.7 mm. Hg:

• more than half of these patients suffered from **moderate to severe hypertension**

• more than half of the cases involved hypertension of at least 6 years' standing, with **many histories of up to 20 years' duration**

THE SIDE-EFFECTS PROBLEM WAS MINIMIZED IN MOST PATIENTS:

Chart shows gratifyingly low incidence of side effects in 233 patients given Singoserp with no other antihypertensive medication

Side Effect	Number	Per Cent
Lethargy	7	2.9
Headache	6	2.5
Gastrointestinal upset	3	1.2
Vertigo	2	0.8
Nasal congestion	1	0.4

DOSAGE:
In new patients: Average initial dose, 1 to 2 tablets (1 to 2 mg.) daily. Some patients may require and will tolerate 3 or more tablets daily. Maintenance dose will range from ½ to 3 tablets (0.5 to 3 mg.) daily.

In patients taking other antihypertensive medication: Add 1 to 2 Singoserp tablets (1 to 2 mg.) daily. Dosage of other agents should be revised downward to a level affording maximal control of blood pressure and minimal side effects.

Singoserp®
(syrosingopine CIBA)

a major improvement in rauwolfia

a major advance in antihypertensive therapy

CIBA
SUMMIT, N. J.

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 (Continued from page 82A)

Retinal improvement occurred in 49 per cent of patients with grades 3 and 4 retinopathy. Death soon followed in patients with grade 4 retinopathy unchanged by the operation.

Urologic Rehabilitation of the Chronically Disabled Patient

J. J. MURPHY. Pennsylvania M. J. 62: 61-66, 1959.

The advent and results of rehabilitating chronically disabled patients have brought the importance of urologic dysfunction to the fore. Of primary concern in dealing with such problems are the anatomic and pathologic conditions of the genitourinary system and the preservation of renal function rather than the social inconveniences associated with improper function of these organ systems.

In evaluating these patients, complete history and physical examination are mandatory, after which cystometric examination will indicate abnormalities in the function of the detrusor muscle and its nerve supply. Intravenous urography will then allow a total visual survey of the tract and indicate the possible need for cystoscopic examination.

In dealing with plegic patients, the initial urologic care is a prime consideration, since it will frequently determine the future course of treatment. Proper function of the bladder and kidneys and the avoidance of infection are of greatest concern.

Systemic factors, including the general state of health and nutrition, and more specific problems, such as the state of hydration, immobilization, catabolic response, and local infection, are of the utmost importance. Specific recommendations include a large fluid intake, an adequate diet with a low calcium-phosphorus content, early body mobilization, and avoidance of infection within and outside the genitourinary tract. Local urinary tract problems include retention, incontinence, calculi, and infection.

Urine retention is treated by 1 of 3 methods of bladder drainage, depending upon the cause, condition, and prognosis of the situation. If short term drainage is desired, an indwelling urethral catheter is recommended. Permanent drainage in an elderly, debilitated patient with a poor prognosis is accomplished by suprapubic cystostomy. Perineal urethrostomy avoids some of the problems of an inlying urethral catheter but is best avoided because of the associated inconveniences. Intermittent urethral catheterization is rarely indicated.

A small catheter introduced with strict asepsis and changed every two weeks will avoid such complications as periurethral phlegmon, periurethral abscess, and epididymitis. Intermittent daily bladder filling will maintain bladder capacity. Cystometric examination will determine the proper time for removal of the catheter, and training of the patient associated with reflex contraction will result in satisfactory voiding.

In patients with poor coordination or bladder contracture, outflow resistance may be reduced by transurethral bladder neck resection or pudendal nerve block. In cases in which the bladder fails to function in spite of all efforts and actually interferes with proper ureteral drainage, supravesical diversion utilizing an isolated segment of ileum provides the best solution to the problem. In rare instances of detrusor muscle damage, surgical resection of the bladder to the trigone and substitution of an isolated segment of sigmoid colon have resulted in restoration of the normal voiding pattern.

Psychiatric Problems of Later Life: III. Treatment and Rehabilitation

I. N. MENSH, J. M. A. WEISS, D. DAVIS, and E. F. GILDEA. Am. Practitioner 10: 225-228, 1959.

Advances in medicine have prolonged the human life span, resulting in an increased geriatric group, which is frequently disabled by mental and emotional disease. In attempting to restore such individuals to happy, efficient, and useful states, the physical, psychologic, and social backgrounds must be carefully analyzed.

The person best equipped to evaluate, plan, coordinate, and direct any program of

therapy is the family doctor. The initial examination must be careful and thorough and must involve a study of the patient's physical state, intellectual capacity, and emotional status in terms of his relationship to his social and physical environment. After a realistic evaluation of the present state has been made, the future potential functional ability may be determined.

The affective psychoses are best treated in a hospital because of the risk of suicide. After adequate treatment of any physical impairments, conservative therapy with tranquilizing drugs may be attempted, but these drugs are usually less effective than electroshock therapy (EST). Reserpine and phenobarbital may actually aggravate a depression, and the mood stimulant drugs do not give prolonged aid and may cause the patient to be anxious and jittery.

EST is the preferred form of therapy in cases of involutional and psychotic depression and carries little danger when used with the muscle relaxant medications. Recurrence of the affective psychoses after EST is quite common, and psychotherapy is therefore useful as adjunctive treatment. Mania in the geriatric group is unusual and is treated with chlorpromazine or EST. Senile psychosis is common in the older age group and subjects patients to impairment of judgment, disorientation, and nutritional deficiencies; treatment consists primarily of medication, patient activity, and group therapy.

Arteriosclerotic psychosis is a fluctuating disease depending upon the effect of the blood pressure, fluid balance, and endocrine imbalances. Tranquilizing and sedative drugs may be of some use in treatment, but caution must be exercised, since a tendency to depression may be aggravated. If depression is severe, EST may be necessary; occupational and group therapy will assist in maintaining emotional stabilty. The cause of an acute delirious state may be related to ure-

SELECTIVE ACTION

...Phenolphthalein, the active ingredient in Ex-Lax, exerts its greatest effect upon the colon[1]...acts gently, overnight ...in the morning produces a stool very much like normal.[2] When a gentle, effective laxative is needed to help establish normal regularity, Ex-Lax may be recommended with confidence. It may be safely given to the young and old as directed.[3] Each tablet of Ex-Lax contains the equivalent of 1½ grains of yellow phenolphthalein, biologically tested for effective action.

EX-LAX
IS SAFE, GENTLE, EFFECTIVE

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Conforms to code for advertising

1. Goodman, L. & Gilman, A.: The Pharmacological Basis of Therapeutics, 2nd ed., Macmillan Co., 1956, p. 1054. 2. Beckman, H.: Drugs, Their Nature, Action and Use, W. H. Saunders Co., 1958, p. 440. 3. Blatt et al: J. of Ped., Vol. 22, No. 6, 1943, p. 725. Abramowitz, E. W.: Am. J. Dig. Dis., Vol. 17, No. 3, 1950, p. 81-82.

HIGHLIGHTS FROM THE A.M.A. COUNCIL ON DRUGS

REPORT ON TRIAMCINOLONE

J.A.M.A. 169:257 (January 17) 1959.

"It [triamcinolone] has an anti-inflammatory potency greater than an equal amount of prednisolone; i.e., comparable suppressive effects may usually be achieved with lower doses of triamcinolone than with prednisolone."

"Triamcinolone lacks the sodium-retaining and edema-producing effects of most other glucocorticoids. During the first several days of administration, it may cause a loss of sodium from the body; an initial mild diuretic action is frequently observed, whether the patient is frankly edematous or not. This is in contrast to the definite sodium-retaining and fluid-retaining properties of cortisone and hydrocortisone and to a much lesser extent with prednisone and prednisolone."

"Except in exceedingly large doses, triamcinolone apparently has no consistent effect on potassium excretion. Hence, neither sodium restriction nor potassium supplementation is ordinarily required during therapy with this agent."

"As with other glucocorticoids, the long-term administration of triamcinolone results in definite catabolic effects, as indicated by impairment of carbohydrate utilization and negative protein and calcium balance. This catabolic effect, coupled with a lack of appetite stimulation which is apparently peculiar to triamcinolone, may produce weight loss that might be undesirable in some patients treated for long periods of time."

"...the voracious appetite, with weight gain and euphoria, characteristic of other steroids, is not seen with administration of triamcinolone."

"Triamcinolone has been used for the management of a wide variety of clinical conditions usually considered amenable to systemic steroid therapy. These have included rheumatoid arthritis and other collagen diseases, allergic and dermatological disorders, certain leukemias and malignant lymphomas, the nephrotic syndrome, pulmonary emphysema and fibrosis, acute bursitis, rheumatic fever, and certain blood dyscrasias. Although clinical experience with the drug in some of the foregoing conditions is not extensive, the many similarities in action between triamcinolone and other potent glucocorticoids would indicate a usefulness for triamcinolone akin to that of other agents of this class."

"There is some evidence that triamcinolone is more effective at a smaller dosage than are other steroids in controlling both the skin and joint lesions in psoriasis, whether or not complicated by arthropathy."

"Triamcinolone appears to compare favorably with other steroids for use in those situations in which edema and sodium retention have been complicating problems."

"It [triamcinolone] may also be the steroid of choice for patients in whom psychic stimulation, euphoria, voracious appetite, and weight gain should be avoided."

"...the drug [triamcinolone] does produce the other side effects and untoward reactions common to the glucocorticoids. At therapeutically equivalent doses, the frequency and severity of clinical manifestations of hyperadrenalism — rounding of the face, fat deposition, and hirsutism — are essentially the same. Likewise, there is little indication that the relative incidence of osteoporosis is materially decreased after the long-term use of the drug."

"Triamcinolone apparently does not cause the euphoria sometimes seen with other steroids, and the occurrence of mental depressions is uncommon."

"Current evidence suggests that the drug [triamcinolone] may not produce as high an incidence of peptic ulcer as do other steroids."

"Cutaneous erythema seems to be a side effect peculiar to triamcinolone."

"The usual contraindications and precautions of glucocorticoid therapy should be followed in the use of triamcinolone, keeping in mind that prolonged therapy with this drug will suppress the function of the patient's own adrenals by interfering with the pituitary-adrenal axis."

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Triamcinolone LEDERLE

Supplied: 1 mg. scored tablets (yellow)
2 mg. scored tablets (pink)
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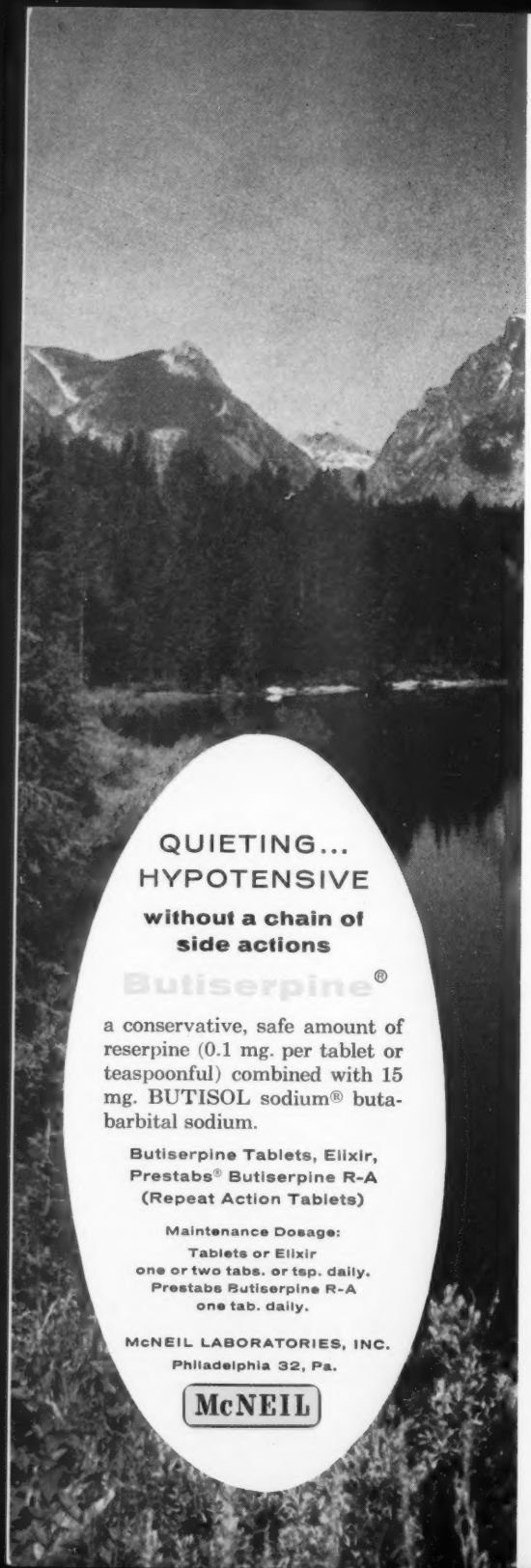
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without a chain of side actions
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Tablets or Elixir one or two tabs. or tsp. daily.
Prestabs Butiserpine R-A one tab. daily.
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digests (Continued from page 89A)

mia, coronary thrombosis, epilepsy, cerebral tumor, or fluid and electrolyte imbalance, the management of such cases depending upon the etiology. Late paraphrenia carries a poor prognosis and usually involves long-term hospitalization.

One of the greatest areas of treatment in all of the various psychiatric disturbances involves the emotional adjustment of the patient to the thought of aging; a considerable number of these patients overreact by either denial or exaggeration of the age-change effects. Such patients frequently present with symptoms relating to their environmental positions, and they may be benefited by psychotherapy. Those senior citizens who retain interest in their occupations, communities, and religions as well as their social and recreational activities will have lesser problems of adjustment.

The Institute of Medicine and Community Health Problems

J. J. MOORE. Proc. Inst. Med. Chicago 22: 162-168, 1959.

In 1915, the Institute of Medicine of Chicago was established, not only for the advancement of medicine but also for the improvement of methods through which the benefits of these advances could be applied in meeting human needs. This organization has assumed great importance by participation of medical leaders in community activities that are involved in bringing health services and medical care to the people of Chicago.

One of the largest and most significant projects undertaken by the Institute has been in the field of chronic illness. As a result, Chicago has led the nation in the completeness of its information, the soundness of its planning, and the services it offers with respect to chronic illness and the care of chronically ill patients.

Chronic diseases have their highest incidence in the age group over 65, with almost 1 of every 2 aged persons having a chronic disease or impairment. Although older peo-

quiets the cough
and calms the patient...

Expectorant action
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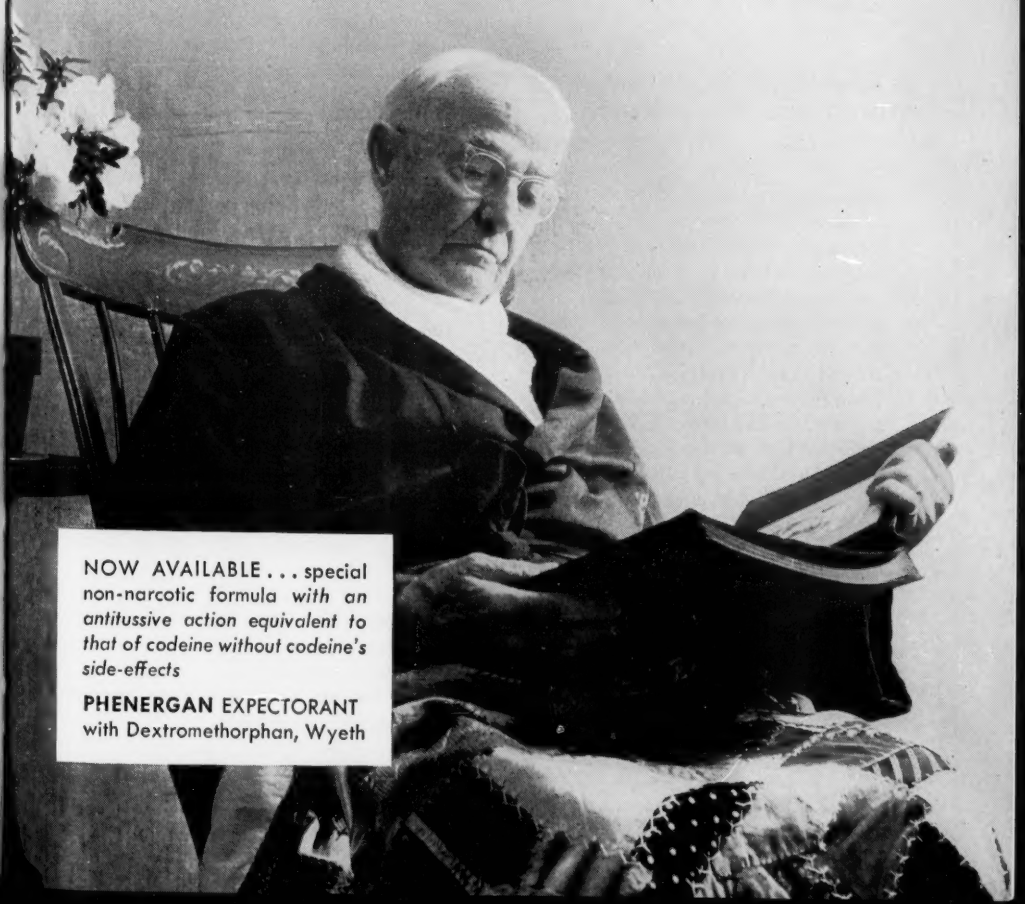

NOW AVAILABLE... special non-narcotic formula *with an antitussive action equivalent to that of codeine without codeine's side-effects*

PHENERGAN EXPECTORANT
with Dextromethorphan, Wyeth

ple account for only 8 per cent of our total population, they occupy 18 per cent of the general hospital beds, 22 per cent of the long-term hospital beds, and 80 to 90 per cent of the beds in nursing homes. The problem of the chronically ill is of increasing national importance in that it is increasing not only in actual numbers but in proportion to the population as well. The number of persons over 65 has multiplied 4 times in the past fifty years, and 40 per cent of long-term disabilities occur in this age group.

With the advanced medical and other types of care that will be afforded in the future, the trend toward an increase in the percentage of persons over 65 years of age will continue, so that approximately 11.4 per cent of the population in the year 1965 will be in this age group.

Acetylcholine in the Mechanism of Headaches of Migraine Type

E. C. KUNKLE. Arch. Neurol. & Psychiat. 81: 135-142, 1959.

Many clues point to dilation of extracranial or intracranial arteries as being essential in the mechanism of migraine headaches. Yet the immediate cause of the vasodilation has not been defined.

Using an isolated heart of the hard-shell clam, an acetylcholine-like substance was detected in the cerebrospinal fluid of 5 of 9 patients during migraine headache. This bioassay method has proved highly specific and more sensitive than any chemical procedure yet developed. In a group of 28 patients with extracranial vascular headache or headache due to nonvascular or uncertain mechanisms, no such substance was found. None was detected in spinal fluid specimens from patients with miscellaneous other neurologic disorders, excepting 2 patients with epilepsy. These findings confirm earlier reports.

Results achieved are consistent with the hypothesis that acetylcholine or some closely allied substance actively participates in the mechanism of migraine headaches, but they do not prove it. Findings of this study also suggest the controlled trial of the atropine group of drugs in patients with various forms of migraine.

The Influence of an Androgen-Estrogen-Thyroid Mixture on Nitrogen Balance and Clinical Status of Older Persons

T. H. MC GAVACK, W. SEEGERS, H. BAUER, M. KRAWZOFF, H. HAAR, J. ENZINGER, and H. FUJIY. West Virginia M. J. 55: 1-5, 1959.

Treatment with an androgen-estrogen-thyroid mixture appears to benefit older people. When a dosage level of 2 to 4 tablets is used daily, nitrogen retention is increased, especially at the 4-tablet level, and excretion of urinary neutral 17-ketosteroids increases in men. Patients often gain weight under the regimen, but no significant alterations in basal metabolism appear. Psychologic-intellectual improvement also results, with patients becoming brighter, more alert and active, hungrier, and generally more optimistic. Men and women with distinct but not yet far advanced signs of senescence are more likely to be helped than are other patients.

Thyroid hormone should be included in the mixture for older persons but should be introduced cautiously, in one tablet of the mixture per day, and gradually increased if no adverse symptoms develop. Overdosage with thyroid hormone is especially harmful in older people with known arteriosclerosis and accompanying cardiac disease.

Side effects of the A-E-T mixture are slight but may include reddening of the skin, edema, and, in women, vaginal bleeding.

These findings are based on a study of 74 aging individuals given 2 to 4 tablets daily of a mixture of 2.5 mg. methyltestosterone, 0.01 mg. ethinylestradiol, and ¼ gr. purified thyroglobulin. Improvement was noted in 75 per cent of patients. Of 8 subjects selected for metabolic studies, 7 showed significant retention of nitrogen while receiving the mixture; 2 women in this latter group retained less nitrogen when given androgen-estrogen without thyroid.

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someone found a better way and here it is...

An economical, easy-to-use unit for drainage collection that affords patient and nurse added convenience; saves time and money for your hospital.

BARDIC STERILE
BEDSIDE DRAINAGE BAG

Unbreakable plastic, sterile; 2000 cc capacity. Transparent and calibrated for easy measurement of patient's output.

BARDIC DUAL HANGER

Easily slipped over bed rail or side of wheel stretcher. For ambulatory patients, hanger serves as a handle. Durable plastic coating.

Aids nursing care—provides a simple yet effective "closed system" without special connectors, stoppers or caps. Reduces offensive odors and prevents entrance of air-borne contamination. Sterile bag reduces danger of ascending infection. Unit is easily emptied without fuss or bother.

Solves storage problem—500 bags occupy less shelf area than 2 glass jugs or 4 used i.v. bottles.

Simplifies housekeeping—the Bardic unit, suspended above the floor, helps maintain the neatness and clinical appearance of the modern hospital . . . keeps floor cleared for cleaning, does away with unsightly bottles; eliminates breakage and spilled urine.

The Cost? . . . as little as 5½¢ per day; less than the expense of collecting, washing, sterilizing and storing jugs or bottles

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activities and announcements

Gerontological Society Calls for Papers

July 15 is the deadline for submitting abstracts of papers to be considered for presentation at the twelfth annual Scientific Meeting of the Gerontological Society, Inc., which will be held at the Statler Hotel in Detroit November 12 to 14. Abstracts should be submitted to the chairman of the appropriate section: biologic sciences, Dr. Warren Andrew, Department of Anatomy, University of Indiana School of Medicine, Indianapolis 7; clinical medicine, Dr. Robert T. Monroe, Geriatric Clinic, Peter Bent Brigham Hospital, 270 Commonwealth Avenue, Boston; psychologic and social sciences, Dr. Marion Bunch, Department of Psychology, Washington University, St. Louis; and social welfare, Mr. Jerome Kaplan, Mansfield Memorial Homes, Inc., Walpark Building, Mansfield, Ohio.

The abstracts should be submitted in duplicate and double-spaced and include the title, author, and institution or laboratory of origin. They should not exceed 250 words and should state the purpose of the investigation, the general methods, material, and results or conclusions. The author should also indicate whether he will present lantern slides and, if so, the size. Members of the individual sections are asked to make their paper conform with the theme of the meeting, New Frontiers of Research and Training in Gerontology, and to put special emphasis on new findings and their significance for scientific and social progress in the field of gerontology. The section on clinical medicine invites papers and exhibits in the fields of dental medicine, veterinary medicine, and nursing as well as regular clinical papers. Abstracts of exhibits should be sent to the chairman of the Exhibits Committee, Dr. Leo Gitman, Brooklyn Hebrew Home and Hospital for the Aged, Howard and Dumont Avenues, Brooklyn 12.

For further information, write to the Program Chairman, Dr. Wilma Donahue, Division of Gerontology, University of Michigan, Ann Arbor.

•

Geriatrics Society to Meet

The sixteenth annual meeting of the American Geriatrics Society will be held at the Traymore Hotel in Atlantic City June 4 and 5. For hotel reservations, write to Mr. William Stern, Reservation Manager, the Traymore Hotel, Atlantic City, New Jersey.

•

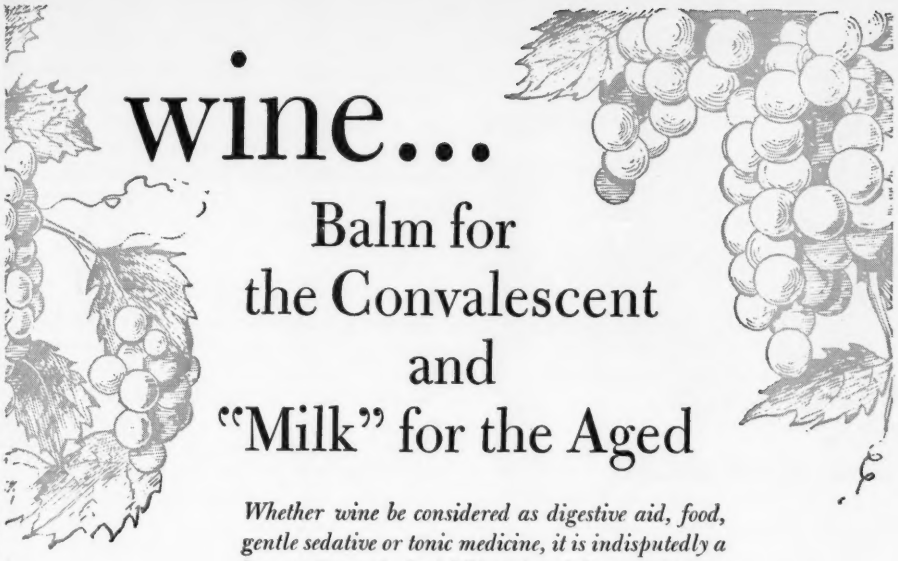
Michigan Conference to be Held

The University of Michigan's twelfth annual Conference on Aging will be held June 22 to 24 at Ann Arbor. The Conference theme, Designs for Retirement, will be discussed as it relates to health, financing, housing, preparation for retirement, and use of time after retirement. Further information may be obtained by writing to Dr. Wilma Donahue, Institute of Gerontology, 1510 Rackham Building, the University of Michigan, Ann Arbor.

•

Leadership Training Institute

As a cooperative effort with the University of Michigan, the Special Staff on Aging of the U. S. Department of Health, Education, and Welfare will conduct a National Leadership Training Institute for the White House Conference June 24 to 26 at Ann Arbor. The Institute will convene following the University of Michigan's twelfth annual Conference on Aging. The Institute, which



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Balm for the Convalescent and "Milk" for the Aged

Whether wine be considered as digestive aid, food, gentle sedative or tonic medicine, it is indisputedly a boon to the aged, the debilitated and the convalescent.

Appetite Stimulant...

Used as an aperitif, wine, through its content of alcohol, its esters, aroma and flavor, excites the olfactory sense and the gustatory papillae—in a word, is a stimulus to appetite.

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Wine has been found to increase salivary flow and stimulate gastric secretion. As such, it is a welcome resource for aged persons and convalescents whose digestion languishes.

Food...

Wine provides two types of food elements—those supplying energy, and nutritive elements found in the grape which contribute to bodily maintenance.

Gentle Sedative...

Described as the safest of all sedatives, wine can often dispel the anxieties, fears, emotional pressures and insomnia of old age and prolonged illness.

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These and other therapeutic uses of wine are discussed in "Uses of Wine in Medical Practice." For your free copy write—Wine Advisory Board, 717 Market Street, San Francisco 3, California.

is designed for those individuals responsible for local, state, and national activities in connection with the White House Conference, will be concerned with the purposes, objectives, and procedures of the Conference, with the aim of helping the organizations at all levels plan their programs and activities for 1959-1960.

•

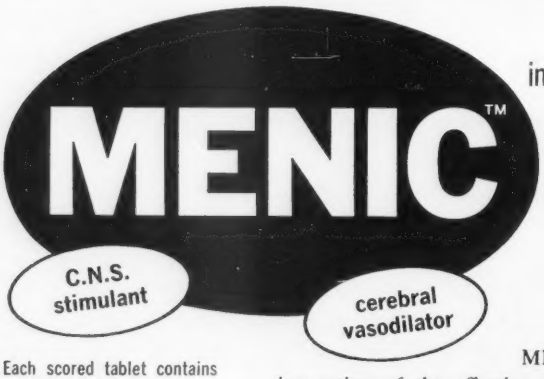
Western Society to Meet

The annual meeting of the Western Gerontological Society will be held May 23 at the Women's City Club in San Francisco. Guest speaker at the meeting will be Wilbur Cohen, professor of public welfare administration, School of Social Work, University of Michigan, and Special Consultant on Aging for the Senate Committee on Labor and Public Welfare. Although arrangements for the forum are nearly complete, additional suggestions will be welcomed. These should be sent to Dr. Harold E. Jones, Institute of Human Development, 2251 College Avenue, Berkeley, California.

•

Service Organizations to Convene

The National Committee on the Aging has called for a conference of nonprofit national service organizations, which serve or have the potential of serving older people, to be held May 4 to 5 in New York. Officials of about 90 national organizations representing health and welfare, education, labor, agriculture, veterans, churches, federal agencies, and civic groups are expected to attend the conference, the purpose of which is to strengthen the interest of these organizations in older people and to explore methods of extending their programs to serve this age group.



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MENIC combines the mutually enhancing action of the effective analeptic, pentylenetetrazole, with the proven cerebral vasodilator, nicotinic acid.

MENIC acts to increase oxygen and blood supply to the brain and so helps to overcome the cerebral ischemia and hypoxia responsible for many senility symptoms. Produced physical, mental and social improvement.[1] Menic makes possible a more comfortable, happier life.

1. Levy, S.: J.A.M.A. 153:1260, 1953.

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there are more than 60,000,000 people over 40 in the U.S.A.[1]

and in this age group constipation is a common problem.[2]

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1. Statistical Abstract of the United States, ed. 78, U.S. Department of Commerce, Bureau of the Census, 1957, p. 6. • 2. Rehfuss, M. E.: Indigestion, Its Diagnosis and Management, Philadelphia, W. B. Saunders Company, 1943, p. 322.

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- suppresses appetite
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activities (Continued from page 102A)

Senior Citizens to Meet

The first annual Convention of Seniors International will be held in Lakeland, Florida, June 10 to 13. Seniors International is a newly organized group which is an outgrowth of National Meetings for Members of Senior Citizen Clubs held in St. Louis in 1958 and in New Orleans in 1957.

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Regional Conferences Planned

The Governor's Council on Aging of the state of Washington will co-sponsor, with local committees, four regional conferences on aging in September and October. Floyd C. Miller, chairman of the Council, has appointed Frederic T. Giles, president of Everett Junior College and Council member, chairman of the conference planning committee. Objectives of the conference will be to secure first-hand reports about what is being done and what needs to be done on the problems and needs of aging persons in the various areas of the state and to stimulate local groups in their activities and services through conference participation. Tentative headquarters for the four conferences are Ephrata, Walla Walla, Longview, and Seattle.

•

Other Meetings of Geriatric Interest

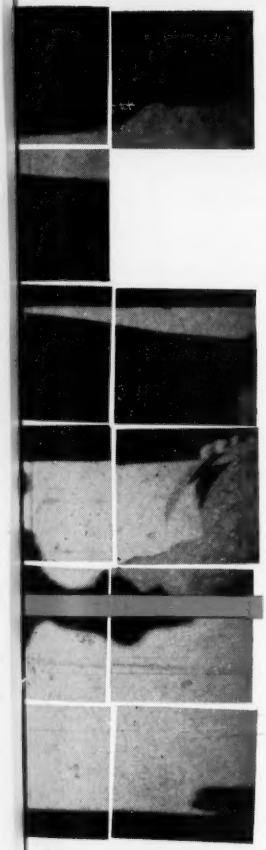
May 24 to 29—*National Conference on Social Welfare,* eighty-sixth annual forum, San Francisco.

June 12 to 14—*Joint Council to Improve the Health Care of the Aged,* first national conference, Sheraton Park Hotel, Washington, D. C.

December 9 to 10—*The National Committee on the Aging,* annual meeting. New York City.

August 7 to 14, 1960—*International Association of Gerontology,* fifth congress, San Francisco.

January 1961—*Second White House Conference on Aging,* Washington, D. C.



EFFECTIVENESS

DIABINESE increases the opportunity of success and minimizes the danger of therapeutic failure. It has the necessary *potency* to assure effective reduction of blood sugar in most maturity-onset diabetics—even in patients who have failed to respond to other oral therapy.[1]

DIABINESE is eliminated *gradually* as the active substance, thus permitting "more even reduction of the blood sugar..."[2] Its effect is "devoid of marked blood sugar fluctuations and wide metabolic excursions"[3] observed with less potent, readily metabolized medication requiring multiple dosage.

SAFETY

DIABINESE is "well tolerated with minimal side effects in the therapeutic range of 100 to 500 mg."[3] Its striking effectiveness and "almost complete absence of unfavorable side effects" have led to the prediction that "Diabinese will eventually prove to be the drug of choice in the sulfonylurea group."[4]

ECONOMY AND CONVENIENCE

DIABINESE has the necessary *duration* of effect to permit convenient once-a-day dosage. Moreover, the average dose of DIABINESE (285 mg. per day)[5] means a substantial reduction in cost to your patients.

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conomical
nce-a-day dosage

upplied: *Tablets,* white, scored, 50 mg., bottles of 60 and 250; 00 mg. bottles of 100.

. Sugar, S., et al.: M. Ann. District of Columbia 27:445, 1958. 2. O'Driscoll, B. J.: Irish M. A. 43:323, 1958. 3. Greenhouse, S.: In Conference on Diabinese and Diabetes Mellitus, New York Acad. Sc., Sept. 25-27, 1958, New York, N. Y. 4. Sheppe, W. M.: West Virginia M. J. 54:467, 1958. 5. Schumacher, O. P., et al.: Cleveland Clinic Quart. 26:12, Jan., 1959.

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ision, Chas. Pfizer & Co., Inc.
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activities (Continued from page 104A)

Postgraduate Courses

Washington University School of Medicine, Division of Gerontology, will conduct its third annual *Postgraduate Course in Geriatric Medicine,* with special emphasis on heart disease and the psychosocial problems of later life, in St. Louis May 21 to 23. The course will feature well-known speakers from the St. Louis area and several authorities from other universities. Clinical application of the basic principles of disease in later life will be stressed. The course is tuition-free and Category 1 credit will be granted to members of the American Academy of General Practice. For further information, write to the Division of Gerontology at the University.

Coming postgraduate courses to be presented by The American College of Physicians include *Cardiac Arrhythmias,* which is to be held May 22 to 24 at the Philadelphia General Hospital, with Samuel Bellet as director; *Psychiatry for the Internist,* to be held at the Psychiatric Institute, University of Maryland Hospital, Baltimore, with Leo H. Bartemeier as director and Ephraim T. Lisansky as co-director; *Special Topics in Internal Medicine,* to be held June 15 to 19 at the University of Colorado School of Medicine, Denver, with Gordon Meiklejohn and C. Wesley Eisele as co-directors; and *Internal Medicine: Selected Topics,* to be held June 22 to 26 at the University of Cincinnati College of Medicine, with Richard W. Vilter as director and John R. Braunstein as associate director. For further information, write to E. R. Loveland, Executive Secretary, The American College of Physicians, 4200 Pine Street, Philadelphia 4.

The Post-Graduate Medical School of the New York University-Bellevue Medical Center will offer the following courses: *The Physiological Basis of Clinical Electrocardiography,* June 1 to 5, J. Marion Bryant, director; *Allergy,* April 10 to May 29, Abner M. Fuchs, director; *Symposium on Modern Therapeutics in Internal Medicine,* June 8 to 19, Charles F. Wilkinson, Jr., director; *Clinical Gastroenterology,* June 22 to 26, James Tesler, director; *The Management of Chronic Kidney Disease,* June 22 to 23, Laurence G. Wesson, director; and *The Management of Hypertension,* June 24 to 25, J. Marion Bryant, director. For additional information, write to the Office of the Associate Dean, New York University Post-Graduate Medical School, 550 First Avenue, New York City 16.

•

Course on Home Administration

The Organization and Administration of a Home for the Aging is the subject of a short course to be presented at Dillsburg, Pennsylvania, June 22 to 26 for administrators, supervisors, board members, social workers, and volunteers. Lectures will be given on more than 100 topics, and each enrollee will receive approximately 200 pages of practical suggestions. The registration fee is $25 for the entire course or $5 for each day. For further information, write to the instructor, Wm. T. Swaim, Jr., Executive Secretary, Presbyterian Homes of Central Pennsylvania, Dillsburg.

•

Seminar on Rehabilitation

The 1959 Portland, Oregon, Summer Session of the Oregon State System of Higher Education has announced a seminar for professional workers on Rehabilitation of the Aging which will carry three hours of credit. Students may enroll for either session, June 22 to July 3 or July 6 to 17. The seminar leader will be Dr. Bernard Kutner, well known authority on problems of the aging, from the Albert Einstein College of Medicine, Yeshiva University, New York City. For further information, write to the Portland Summer Sessions Office, 1633 Southwest Park Avenue, Portland.

•

Grant for Aging Center Made

A grant of $388,000 has been made to Duke University by the National Institutes of Health for the construction of a Center for

for prevention of

angina attacks

more effective than vasodilators alone

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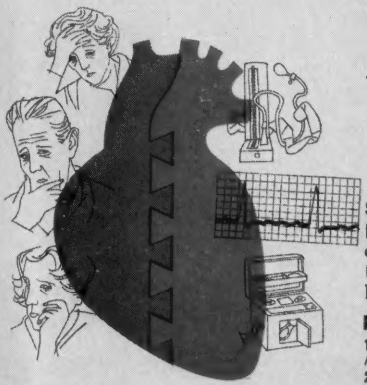
The long-acting nitrate, PETN, helps maintain normal myocardial metabolism while Miltown relieves fear, anxiety and tension. As a result, Miltrate controls both physical and emotional causes of angina attacks.



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Supplied: Bottles of 50 tablets.

Each tablet contains: 200 mg. Miltown + 10 mg. pentaerythritol tetranitrate.

Usual dosage: 1 or 2 tablets q.i.d. *before meals* and at bedtime. Dosage should be individualized.

References:

1. Shapiro, S.: Observations on the use of meprobamate in cardiovascular disorders. Angiology 8:504, Dec. 1957.
2. Friedlander, H. S.: The role of ataraxics in cardiology. Am. J. Cardiol. 1:395, March 1958.
3. Eskwith, I. S.: The holistic approach to angina pectoris. Am. Heart J. 55:621, April 1958.

WALLACE LABORATORIES, *New Brunswick, N. J.*

*TRADE-MARK CML-7797-19

activities (Continued from page 108A)

the Study of Aging, which will provide facilities for research on aging in the medical, biologic, social, and behavioral sciences. The beginning date for construction will depend on how soon matching funds, which are now being sought by the University, are obtained. The new building will bring together researchers who are currently working under crowded conditions in widely separated parts of the University and will permit initiation of projects which have hitherto been prohibited by lack of space. Included in the building will be laboratories for such continuing projects as studies of how aging acts upon the body's central nervous system and the blood vessel changes that accompany aging. Quarters will be provided for the Interdisciplinary Health Team, which coordinates the findings of other research groups working in the field of aging. Other facilities include waiting rooms for elderly people who serve as volunteer research subjects, offices for old age studies linked with sociology, economics, law, and religion, and administrative offices and research record rooms.

•

Heart Grants Awarded

The American Heart Association has announced the award of $1,562,243 to 182 scientists engaged in a broad range of research studies, most of them in the category of basic research, aimed at pinpointing the underlying causes of heart and blood vessel disease. The awards, which went to individuals in 28 states, the District of Columbia, and two foreign countries, are for the twelve months beginning July 1. They represent the first part of the 1959-1960 national research support program in which the national office participates jointly with its state and local affiliates. The second group of awards,

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representing grants-in-aid as distinct from individual fellowships and investigatorships, will be announced in the near future.

•

Home Rehabilitation Nursing

Through the cooperative efforts of the District Nursing Association of Northern Westchester and the Westchester County Department of Health, New York State, chronically ill and disabled patients confined to their homes are provided with organized nursing and restorative services. A full-time physical therapist and a consultant in physical medicine work with visiting nurses and the private physicians of the patients in determining possible treatment procedures. The nurse is instructed in the performance of such procedures as bed exercises, retraining of muscles, heat applications, moving from bed to chair, crutch walking, and use of walkers or pulleys and eventually will be able to give most of the treatment, with periodic check-ups by the therapist. The physiatrist and therapist meet once a month with the nurses, the Health Department nutritionist, and any social workers involved to discuss individual patients' progress. In a group of 44 patients, whose median age was 64.5 and whose diagnoses ranged from strokes and degenerative diseases of the nervous system to arthritis and fractured hips, nearly 70 per cent showed improvement at the termination of service.

•

Aging Problems Considered at Conference

A workshop on the problems of aging was included in the program at the American Orthopsychiatric Association meeting held March 30 to April 1 in San Francisco. Maurice E. Linden was chairman of the group, and participants were Ewald Busse, Elias Cohen, Wilma Donahue, Laurence Greenleigh, Louis Kuplan, Alexander Simon, and Jacob Tuckman. Among the subjects discussed were the neurotic predisposition of older people, patterns of family interrela-

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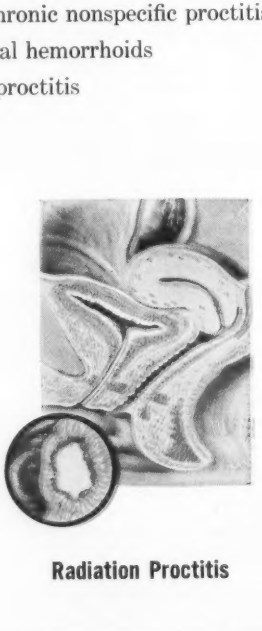
- Cryptitis

Ulcerative Colitis



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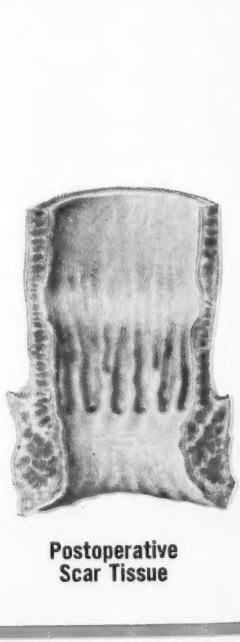

Postoperative Scar Tissue

Supplied: Suppositories, boxes of 12. Each suppository contains 10 mg. hydrocortisone acetate, 15 mg. extract belladonna (0.19 mg. equiv. total alkaloids), 3 mg. ephedrine sulfate, zinc oxide, boric acid, bismuth oxyiodide, bismuth subcarbonate, and balsam peru in an oleaginous base.

Wyanoids® HC

Rectal Suppositories with Hydrocortisone, Wyeth

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 (Continued from page 111A)

tionship, special health problems in the aging, biologic stages of maturation, community responsibilities, professional development in gerontology, cooperative governmental planning, and new areas for research.

•

Welfare Study

The answer to the question of how six million Americans can obtain adequate medical care, and pay for it, when they already depend on public welfare for the essentials of food, clothing, and shelter may lie in the more than 20,000 individual records now being studied at the University of Michigan School of Public Health. Over the past year and a half, field workers have been collecting data from welfare departments in Connecticut, Illinois, Maryland, and Rhode Island in the hope that they might gain information that would apply to the nation as a whole. According to Dr. Solomon J. Axelrod, principal investigator of the project, which is supported by the American Public Welfare Association, the researchers are currently concentrating on the amount and kind of medical care received by persons drawing Old Age Assistance because of the increasing number of older people in our population and because the cost of their medical care uses an increasing share of the tax dollar spent for relief. An additional grant of $27,903 to support detailed analysis of the data gathered so far has been awarded.

•

Research Program Urged

Dr. Edward L. Bortz, past president of the American Medical Association, recently told a Conference on Family Living at Disneyland, California, that the time is appropriate for a long range research program of old age and that such a program should be directed to a detailed clinical and health appraisal of those approaching present retirement age limits to ascertain their physical and mental status and to a study of ways and means to keep all older people active so that they may continue as contributing members of society. Dr. Bortz also called for mobilization of information already available to prevent much disease and deterioration.

•

Forums Planned for Older Women Workers

The National Federation of Business and Professional Women's Club is cooperating with the Department of Labor in conducting Earning Opportunities Forums for Mature Women Job Seekers. Initiated in 1956 as part of the Department of Labor's program for older workers, the community forums focus attention on the types of jobs and training available to women and on the women in the locality who are available to fill them. The one-day meetings bring together women who are seeking employment, representatives of employers, and members of the community who are seeking to help women market their skills and services.

•

EDITOR'S NOTE

The last paragraph in the book review of *Morphological Integration*, which appeared on page 50A of the March issue of *Geriatrics*, should have read: "The large number of measurements required and the laborious calculations make it probable that the method will be used primarily by paleontologists; neontologists, with more direct avenues of approach to the whole organism, will probably use them."

On page 267 of the April issue, the second sentence of the second paragraph in the Letter to the Editors entitled, "Use of Vacant Beds in Tuberculosis Sanatoriums," should have read, "The percentage of younger persons developing clinical disease is apparently the same as it always has been among tuberculin reactors, but reactors have now become so few that, in the aggregate, the number of clinical cases developing in this age period is markedly reduced," and the second sentence in the fourth paragraph should have read, "Most of these persons are from countries where nearly all adults are infected."

manufacturers' activities

New Steroid Available

Deronil (dexamethasone), a new steroid hormone which is more active than the older corticosteroids in the treatment of rheumatic, allergic, dermatologic, and ocular diseases, has been introduced by Schering Corporation, Bloomfield, New Jersey. The new drug offers the advantage of greatly improved anti-inflammatory effect with the use of much lower dosages. Deronil, which is now available in 29 countries, was reported on in the Journal of the American Chemical Society in August 1958 and was first introduced to the medical profession in Canada in November 1958.

•

New Antihypertensive Agent

Diupres, a combination of the antihypertensive agents, Diuril and reserpine, has been released by Merck Sharp & Dohme, Division of Merck & Co., Inc., West Point, Pennsylvania. Indicated in the management of all degrees of essential hypertension, Diupres provides increased antihypertensive activity even though the amount of reserpine is less than the usual dose of the tranquilizer alone, thus reducing the incidence of reserpine-like side effects. The new drug can also be used as basic therapy to be supplemented by hydralazine or a ganglionic blocking agent, which are both effective at a much lower dose when used with Diupres than when used alone. Diupres therapy also relieves headache, dizziness, palpitation, and tachycardia and may in some cases eliminate anginal pain. In addition, the patient's diet may be more palatable since more salt can be used with the new drug.

•

New Chelating Agent

Abbott Laboratories, North Chicago, recently developed a synthetic compound, the disodium salt of ethylenediamine tetra-acetic acid, which unites with cations to form chelates or ring complexes. Supplied as Endrate Disodium, the new agent forms chelates with the cations of most metals, and, because of its ability to form a soluble chelate with calcium, its use has been suggested in the treatment of pathologic calcification. Clinical reports indicate a beneficial action in the management of intractable angina pectoris, scleroderma, and porphyria, and there is evidence that Endrate Disodium is an effective agent for the treatment of digitalis intoxication.

•

Proteolytic Ointment for Skin Ulcers

Reliance on antibiotics as the primary local treatment of skin ulcers is unjustified, according to Dr. Charles H. Carter of Gainesville, Florida, who says that a more rational approach is to remove devitalized tissue and viscous exudate which serve as a breeding ground for bacteria in the wound and hinder the humoral mechanisms of the body. Of 37 patients whose ulcers had resisted treatment with antibiotics, 36 were completely healed within fourteen to sixty days after treatment with Panafil ointment, a product of the Rystan Company, Mount Vernon, New York. Gross infection was uniformly eradicated by use of the ointment, and bacteriologic data, which revealed the presence of numerous strains among the series of wounds, indicated that results with Panafil were not affected by the type of organism present. The ointment contains the enzyme papain to digest necrotic tissue and debris and unblock capillary and lymphatic circulation in the wound; urea, a protein solvent; and water-soluble chlorophyllin to promote health granulations and prevent possible irritation from protein-breakdown products.

•

Developments in New Products

Aristocort triamcinolone, a new steroid compound introduced in January 1958 for the treatment of rheumatoid arthritis, allergies, and skin disorders, is the most important product developed recently by the American Cyanamid Company, Lederle Laboratories Division, Pearl River, New York, according to Dr. Wilbur Malcolm, company president.

ANALEPTONE™

RESTORATION OF FACULTIES AND BODY TONE

The mutual synergic relationship between mental perceptions of all kinds and body tone has been demonstrated.[1]

The combined central nervous and peripheral actions of ANALEPTONE improve *both* mental faculties and body tone. These actions commend its use in a wide range of disorders common to aged patients.

• CEREBRAL HYPOXIA • CONFUSION
• APATHY • ANTISOCIAL BEHAVIOR
• DEPRESSION • LOSS OF MEMORY
• INABILITY TO CONCENTRATE

NOTE: No side effects are observed save for occasional and transient "niacin flush" in sensitive individuals.

1. Boernstein, W. S.: Tr. New York Acad. Sci. *20*:72, 1957.

ADDITIONAL REFERENCES: Smigel, J. O.: M. Times *85*:149, 1957; Levy, S.: J.A.M.A. *153*:1260, 1953; Thompson, L. J., and Procter, R. C.: North Carolina M. J. *15*:596, 1954; Erwin, H. J.: Missouri Med. *53*:1071, 1956.

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Each teaspoonful (4 cc) contains:	
Pentylenetetrazol	200 mg.
Niacin	100 mg.
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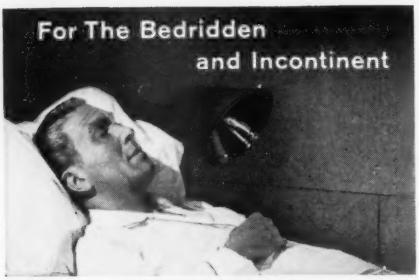
SUPPLIED: Bottles of 8 fl. oz.

ANALEPTONE TABLETS	
Each tablet contains:	
Pentylenetetrazol	100 mg.
Niacin	50 mg.
Pepsin 1:10,000	5 mg.

SUPPLIED: Bottles of 100.

DOSAGE: One-half to one teaspoonful of Elixir; one to two tablets, 1 to 3 or 4 times daily.



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DIAPARENE OINTMENT

Therapeutically effective for decubitus ulcers, and controls offensive odor usually encountered in incontinents.[1,2]

DIAPARENE DUSTING POWDER

Dusted into bed linens, works as adjuvant therapy with DIAPARENE RINSE for decubitus ulcers, with a marked decrease in the usual offensive odors.[1,2]

DIAPARENE PERI-ANAL® CREME

Healed or improved all cases of decubitus ulcers under observation.[2,3]

DIAPARENE SURGICAL SOLUTION

DIAPARENE impregnated dressings, diapers, or towels are effective prophylactically in urinary excoriation.[4,5]

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(1) Smigel, J.O.: M. Times 83:408, April 1955
(2) Smigel, J.O., et al: J. Am. Geriatrics Soc. 5:671, July 1957
(3) Craven, D.M.: Am. J. Nursing 56:1293, October 1956
(4) Nagamatsu, G., et al: Geriatrics 4:5, Sept.-Oct. 1949
(5) Barwise, C.M., Caron, M.A.: Mental Hospitals 3:6, June 1952

manufacturers' activities

(Continued from page 114A)

In a speech before the Cleveland Society of Security Analysts last December, he said that " . . . researches resulted in the introduction to physicians early in 1958 of a significantly different form of the enzyme product, Varidase streptokinase-streptodornase, with promising new uses for the drug Available previously only in injectable form, the new product, Varidase Buccal Tablets, administered orally by slow absorption, is proving its effectiveness in the treatment of inflammation and other physical impairments in the nature of swellings, abscesses, blood clotting, and related local congestion. . . ."

Among other products introduced was Pathibamate meprobamate with tridihexethyl chloride, an agent for the treatment of gastrointestinal ulcers.

•

Founder of Vitamins Celebrates Birthday

Dr. Casimir Funk, world famous pioneer in vitamin research, marked his seventy-fifth birthday on February 23. He is president of the Funk Foundation for Medical Research, a nonprofit organization devoted to cancer and related research, which is supported in part by the U. S. Vitamin Corporation, New York City. It was at the Lister Institute in London, in 1911, that Dr. Funk made his discovery which earned for him the accolade "father of vitamin therapy." He isolated from rice polishings a substance that cured beriberi, and, knowing this substance was essential to life, he gave it the name "vitamine," later changed to vitamin. In 1936, he advanced the theory that minerals and vitamins are nutritionally interrelated and that, like vitamin deficiencies, mineral deficiencies are widespread and are usually multiple, rarely single. These observations led to the development of the first multiple vitamin-mineral concentrate, Vi-Syneral, a product of the U. S. Vitamin Corporation.